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TUBERCULOSIS AT THE CROSSROADS*

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Tuberculosis was described by Bunyan as "Captain of the men of Death." Perhaps the most important fact about tuberculosis is that it no longer holds that pre-eminent title. But it is still the main killer of youth in its prime, and causes in this country nearly one-third of the deaths between the ages of 15 and 39 and a total of 24,000 per annum at all ages. As a cause of death phthisis has been declining throughout the period since deaths were first registered and classified in 1838—i.e., nine years before the appointment of Dr. Duncan as first medical officer of health in Liverpool (Ransome, 1915). The decline has been remarkably continuous and steady since that date, though fluctuations are noticed at times, epidemics of influenza (e.g., 1890) and the two world wars being occasional causes of temporary rises. Generally when these events had passed the decline continued as before. What, then, has been the major cause of its decline ? It is chastening to take the long view in this matter.

Tuberculosis mortality, like infantile mortality, has always been regarded as one of the best indices of the sanitary well-being of a community. The causes of the great reduction of infantile mortality are complex, and it is not easy to give each factor its appropriate weight. May not the causation of the fall of tuberculosis mortality be likewise complex ? Certainly to regard this mortality rate as a sensitive sanitary index is a clear indication that we consider the reasons for its fall to be complex.

In 1847 the English mortality from phthisis was 3,189 per million, and the female mortality was higher than the male ; nearly a century later the standardized death rate was 528 per million—i.e., one-sixth of what it was in 1847—and the female mortality was 53% of that of the males.

Tuberculosis Mortality in Infancy

The ages at death also show some striking differences. In 1860 18% of the deaths from tuberculosis in Liverpool were at ages under 5 years ; and in 1880 the proportion was 32% ; in 1946 the proportion was 6.5%, or only about one-fifth of the 1880 figure. It is, however, reasonable to ask whether all the infantile deaths ascribed to tuberculosis in 1880 were in reality so caused. One may question the significance of diagnoses such as tabes mesenterica, and be in doubt whether that title did not include deaths from prematurity, marasmus, enteritis, etc. If we consider deaths from tuberculous meningitis we find that equally important changes have been taking place, more especially in infancy and childhood. I have obtained from the Registrar-General, and have taken out from the Liverpool records, the deaths at ages under 1, 1 to 5, 5 to 10, and so on up to 25 years of age, since 1915. One of the difficulties in investigating tuberculosis records is to be sure that one is dealing with *comparable* statistics, and it is for that reason that the figures go back to only 1915 ; before then differences both of nomenclature and of tabulation would gravely complicate comparisons. What is shown, however, is remarkable. In Liverpool the crude mortality during the first year of life in 1947 was only 9% of that recorded in 1915 ; in the next four years of life it was 18%, from 5 to 10 years 26%, from 10 to 15 years 40%, and at higher ages the reduction is smaller. But the total phthisis mortality has only been halved in these twenty-eight years. Similar, though not so pronounced, reductions in the deaths of infants ascribed to tuberculous meningitis have occurred in England and Wales. The higher the total tuberculosis mortality the greater the proportionate reduction in the meningeal fraction of that total. In the middle of last century many deaths of infants were ascribed to acute hydrocephalus or to cephalitis, the word meningitis seldom being used.

What is the significance of this rapid reduction in tuberculo-meningitic mortality ? Tuberculous meningitis ensues when a tuberculoma in the brain or meninx infects the water-bath in which the brain lies ; the tuberculoma in this case is the result of a blood-borne infection arising, as a rule, in a primary infection. It would appear, then, that this very rapid reduction in meningeal deaths results from a quite considerable reduction in infection of infants with the human bacillus, or at least of massive infection. That this rapid rate of reduction follows upon the passing of the National Insurance Act, 1911, and the inception of sanatorium benefit and the setting up of tuberculosis departments generally may be no coincidence. In Denmark in 1945 only 28 deaths from tuberculous meningitis took place, of which four were in Copenhagen. This observation may be a valuable clue in the tuberculosis labyrinth. One thing is sure: it bears little or no relation to the improvement of milk supplies or the pasteurization of milk. The case for these as preventive of tuberculous peritonitis and of bone and joint disease needs no further comment ; it has been adequately presented by Wilson (1942) and is conclusive. Every case of tuberculous meningitis in childhood should be regarded as a pointer to a dangerous open case of respiratory tuberculosis in the immediate *entourage* of the sick infant ; this case should at once be sought and the appropriate action taken when found.

In comparison with a guinea-pig, man is resistant to attack by the tubercle bacillus. He cannot presumably be infected by a single bacillus as can the cavy. Every overt case of tuberculosis is an example of a breakdown of resistance. Repeated massive doses of infection, especially in infancy, provide one of the methods by which that resistance is overcome. Any measures which tend to reduce or prevent such massive infections will be preventive of tuberculosis—the disease that kills and maims. I have used the tuberculo-meningitic mortality as a possible index of a reduction in massive infection ; other evidence will appear later. But, regarding the continuous decline in phthisis mortality for over a century, even with the greatest regard

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for the sanitary achievements of Duncan and his successors we cannot think of sanitation as the major factor in the reduction.

Social and Economic Factors in Tuberculosis Causation

We must accordingly seek for a cause for the reduction in some more general factor of social amelioration which would affect the resistance of the mass of the population; for the general occurrence of infection within the first twenty years of life—at least of *urban* life—is widely recognized. This belief is based primarily on the findings of Naegeli (1900) in Zurich and of Burkhardt (1906) in Dresden. Naegeli found evidence of tuberculosis in 17% of necropsy examinations in those under 18 years of age; but in those over 18 years old the proportion was 93%. Burkhardt found the proportions in the same two age groups to be 38% and 91% respectively. When the use of the cutaneous tuberculin reaction was applied by von Pirquet (1911) to children in Vienna in 1909 he found that in the age group 13–14 years no less than 91% of the children reacted positively. These results relate to urban populations. The Prophit Survey (1948), applying the Mantoux reaction to student nurses from Wales and Ireland upon entry into hospital, found 26% negative reactions as against 18% negative amongst English nurses. In England there was only a small difference between the percentages of negative reactors among nurses of urban (18%) and rural (20%) provenance, but in Wales and Ireland the proportions were 19% and 35% respectively. It is evident that in recent years in the rural parts of the British Isles, more especially Wales and Ireland, infection with tuberculosis has by no means been universal, even if we take into consideration that a proportion of the negative reactions may once have been weakly positive and have subsequently reverted. Among London medical students only 14% were *negative*; in students in some universities in the United States the proportion is reversed and only 10–15% were *positive*.

Some economists have used the price of wheat as an index of nutrition, and a close correlation was found in some countries, notably Germany, between this figure and that of the phthisis mortality; but Sir Arthur Newsholme pointed out that in France and Ireland there was no such parallelism. This is not surprising, for money is constantly changing its value in relation to goods.

When for the price of wheat we substitute the "real value of wages"—i.e., what you can get with the money you earn—as was done by Ewart in 1923, there is revealed a remarkably close inverse correlation during the period 1851 to 1915 in England and Wales. Malnutrition and famine have again and again been shown to be productive of a rise in tuberculosis mortality. The 1914–18 war appeared to indicate fat shortage as productive of a rise in deaths from phthisis; the rise was earliest and greatest in blockaded Germany, later and smaller in Great Britain, where U-boat warfare limited imports, and latest and least in the United States, where the shortage was least felt. Shortage of fat-soluble vitamins was present in greater or lesser degree, but Danish and Swedish experiences negative a shortage of vitamin A as the main factors in the increase. There was also a shortage of first-class proteins according to Faber (1938), and he regarded this as the more important. It is not practicable to pin the effects of malnutrition to the deficiency of one ingredient of the diet. The part played by fatigue in the liability to develop clinical tuberculosis in wartime must not be overlooked (M.R.C., 1942).

During the 1939–45 war the rise in deaths from tuberculous meningitis and in young adults in this country pointed to factors other than nutrition being operative, and the increased exposure to infection in air-raid shelters or elsewhere appears to have been a major cause. This rise reinforces the belief that a high proportional rate of mortality from meningitis indicates a high degree of massive infection in infancy and childhood.

The real value of wages gives a measure of the capacity of the average citizen to acquire goods, but it does not indicate how this capacity is distributed among the population or on what goods it is expended. The Registrar-General's figures show the heaviest incidence of tuberculosis to be upon the lowest-paid workers—i.e., social Class V—whose tuberculosis mortality is double that of the professional Class I.

Numerous coefficients have been calculated (see especially Hart and Wright, 1939) which show a significant high association of tuberculosis mortality on the one hand and poverty, pauperism, substandard housing, and overcrowding on the other. Hart and Wright applied the method of partial correlation,* which endeavours to weight the several possible factors taken into consideration. The significance of overcrowding appeared to be increasing. There can be no doubt that poverty is closely associated with tuberculosis, and that tuberculosis also causes poverty. Poverty is accompanied by malnutrition, bad housing, and overcrowding, the last tending to produce close personal contact with open cases. In view of the great overcrowding in so many of our great cities we cannot expect any automatic reduction in tuberculosis in the near future. As McGonigle observed, better housing without a rise in real wages may, owing to raised rents, lead to deterioration in nutrition.

The steady rise in the real value of wages seems to have been a major cause of the reduction of tuberculosis mortality, but this rise was checked at the turn of the century and reversed during the 1914–18 war (Hart and Wright, chart 4), and appears to have been reversed in and after the 1939–45 war. Thus the index of real earnings, which was 127 in 1875, had risen to 244 in 1939 and has fluctuated since then. A fall in this index also occurred in the 1914–18 war, reaching 176 in 1913 and falling to 146 in 1916; it rose, however, to 205 in 1920. The economic effects of the recent war have, however, been more serious than in the previous war, and we cannot anticipate any such quick recovery. If this rise in the real value of wages has indeed been the cause of the decline of tuberculosis during the nineteenth century it is urgent that we take stock of the position in which we now stand. At the present time there is a world shortage of foodstuffs accompanied by a high world level of prices of transportable foods. To expect an early resumption of the increase in the real value of wages in this country—though possibly not in the United States—would be tantamount to being blind to the most salient economic feature of the times in which we live. If we translate increased real value of wages into terms of better nutrition and housing, involving greater resistance and less exposure to infection in the home, are these really the sole causes of the reduction of mortality in the past?

*Coefficients of correlation (i, v, and vi are from Pearl, 1940):

(i) Tuberculosis mortality in *arrondissements* of Paris, 1911–17, and the proportion of the population so poor as to be not assessed to house tax	+0.977	±0.004
(ii) Total pauperism and phthisis in England and Wales, 1866–1903 (Newsholme)	+0.89	
(iii) Mortality for respiratory tuberculosis and substandard conditions of housing in 76 county boroughs (Hart and Wright, 1939), 1931, 1931–3:		
Males 15–24	+0.568	
(iv) Ditto: Females 15–24	+0.663	
(v) Tuberculosis mortality and overcrowding (more than 3 persons per room) in Vienna, 1897	+0.892	±0.047
(vi) Ditto: (more than 2 persons per room) in London, 1908–12	+0.774	±0.075

Segregation of Infective Cases

Sir Arthur Newsholme (1908, 1923) gave evidence that there was a close parallelism, especially in later years, between the proportion of deaths from phthisis taking place in hospitals and other residential institutions and the general tuberculosis mortality rate. In 1869–70, when the death rate in England and Wales from respiratory tuberculosis was 24.4 per 10,000 population, only 8.3% of the deaths *from all causes* occurred in public institutions. "In the year 1920, 36.2% of the total male and 26.5% of the total female deaths from phthisis in England and Wales occurred in hospitals, commonly after prolonged, and often repeated, stay of the patients in these hospitals." Newsholme's figures were severely criticized by Alice Lee (1915) on the ground that his measures of segregation were badly chosen. Power (1908) had earlier cast doubts on the validity of Newsholme's conclusions as applied to the nineteenth century.

I have been able to investigate the matter further, so far as it relates to deaths from tuberculosis (mainly phthisis) in the hospitals and institutions of the city of Liverpool during the period 1860 to 1946, by taking samples at five-yearly intervals, as shown in the following table:

Year	Percentage of Deaths from Tuberculosis in Residential Institutions	Mortality from Tuberculosis per 1,000
1860	13·7	4·4
1865	17·2	5·3
1870	14·1	4·1
1875	17·4	3·8
1880	14·4	3·7
1885	21·7	2·9
1890	20·9	2·7
1895	27·6	2·8
1900	37·2	2·5
1905	44·2	2·0
1910	50·5	2·0
1915	35·8	2·0
1920	42·7	1·7
1925	51·0	1·5
1930	51·1	1·4
1935	60·0	1·1
1940	55·1	0·9
1946	57·2	0·9

From these figures we obtain a coefficient of correlation of -0.94 ± 0.017, which indicates a very high degree of inverse association. It is subject to the criticism that the array of figures is too small for accuracy, but *a priori* it appears probable that the increasing removal of cases of open tuberculosis to hospital has had considerable influence on the reduction of tuberculosis in this country and elsewhere, especially during the present century. One may well think that this factor has played an increasing part in that reduction since the introduction of sanatorium benefit in 1911. The prohibition of indiscriminate expectoration may also have helped in reducing infection.

At this point we must face present realities. At the end of 1946 in this country, despite the addition of 2,440 to the number of "tuberculosis beds" provided, there was a waiting-list of 7,025 tuberculous patients (Ministry of Health, 1946). This position arises from a shortage of nurses, especially of sanatorium nurses, and not of beds. In sanatoria the occurrence of a case of tuberculosis among the nursing staff is, in my experience, exceptionally rare. The mortality from tuberculosis among nurses is no higher than that of the general female population of the same ages, but the morbidity would seem to be higher. Any active campaign against tuberculosis, whether preventive or curative, is at present in this country absolutely dependent upon adequate provision of hospital beds. If we investigate anti-tuberculosis programmes in either Scandinavia or the United States there appear to be waiting *beds* rather than waiting-*lists*.

The former standard of one sanatorium bed per tuberculosis death per year is certainly out of date. The actual provision in England and Wales is 1.3 beds per death (in Liverpool 1.5), but in Germany it is 2.2 (0.7 in Berlin) and in Canada 2.5; coming to Scandinavia, in Stockholm it is 2.5, in Copenhagen 2.8, and in Oslo 3.0. It is necessary to make the best possible use of available beds, both for the cure of the individual patient and, with emphasis, for the achievement of the best preventive result.

Tuberculosis Among Nurses

I do not think any responsible person in charge of a hospital admitting patients suffering from tuberculosis can be happy about present conditions, under which Mantoux-negative nurses, medical students, and others come into contact with infectious cases. To find that such a person is tuberculin-negative and presents no *x*-ray evidence of a prior infection seems to require some attempt at least to increase specific resistance, even if complete immunity is out of the question. How far the Bacille Calmette-Guérin (B.C.G.) or the vole bacillus can meet the case I will discuss later. This is a matter of serious importance if we are to continue to nurse infectious, often advanced, cases of tuberculosis away from the home, for it appears highly desirable to increase the proportion of sputum-positive cases so isolated.

One of the factors causing inadequacy of the beds available for the treatment of tuberculosis is the increase in the average length of stay in sanatoria, which now often amounts to twelve months or more. This arises partly from the commendable wish of sanatoria physicians to do the best for their patients and partly from the increasing armamentarium, both medical and surgical, available for treatment. Earlier diagnosis by mass radiography or otherwise has, of course, an opposite effect if the early case can be admitted at once, but often this cannot be done. It is deplorable that such patients have to wait for admission while the most favourable moments for curative treatment are slipping away and while they are possibly becoming sputum-positive, to the danger of their families. In 1938 as many as 65% of patients admitted to sanatoria in England and Wales were classified as intermediate or advanced cases.

Alterations in Ages at Death

There is another aspect of the epidemiology of tuberculosis which should be emphasized—namely, the marked differences between the resistance of races that have for long been exposed to tuberculosis and those that have not. Calmette (1923) presented the evidence fully and I have summarized it (Stallybrass, 1931). There can be no question of the reality of these racial differences in resistance to tuberculosis. Cobbett (1925) expanded Calmette's law of tuberculosis into the following: "Peoples are more resistant to the attack of the infectious diseases of their own countries and districts than to that of foreign diseases with which neither they nor their ancestors have been accustomed to come in contact." Among pygmies brought into this country from Africa the disease is rapidly fatal and epidemic in incidence; among Jews who have lived for centuries in towns, often in ghettoes, the resistance is high. This clinical difference in the course of the disease is accompanied by a considerable variation in the age at death. Drolet (1930) has published a diagram contrasting the distribution of male tuberculosis deaths per 1,000 among negroes and Jews respectively age by age in 1926–8 in New York City. Both races lived under closely similar housing conditions. This diagram emphasizes two points: (*a*) the mortality in the first four years of life was about 60% higher among negroes than among Jews; and (*b*) the peak age at death is about 25 years among negroes and about 45 years among Jews, a

difference in modal age at death of about 20 years. Such differences of age at death may be regarded as due to the survival of the fittest following Darwinian selection over a long period.

In Liverpool in the past 90 years there has been a marked reduction in the *deaths* attributed to tuberculosis in the first five years of life. Bearing in mind what was previously said in relation to meningitis and tabes mesenterica, the proportion of infant deaths to the total mortality has markedly fallen. In 1860 it was 15.8% and in 1935 0.8%, but it showed a rise in 1942 to 2.6%, mainly attributable to meningitis. Similar but smaller fluctuations occurred in all ages up to 5 years.

Again in Liverpool, the peak age *at death* was 20–25 years in 1860–70; that period included the Lancashire cotton famine. It rapidly rose to 30–40 years by 1875, and has so remained with the single exception of 1943 —following the air raids—when it fell back to 25–30. There has in fact been a considerable shift towards older ages, even up to 90. In Copenhagen and Stockholm there has been a shift towards younger ages in the *death rates* by ages.

The changes in the Liverpool figures closely simulate Drolet's racial differences. But it is hardly credible that Darwinian selection could have affected these changes in a mere 80 years: social and economic changes seem to provide a more probable explanation.

Differential Sex Mortalities

In 1838, when deaths were first registered, the female tuberculosis death rate was higher than the male. The rates crossed in 1860, and by 1925 the males constituted 60.2% of the total. With the increasing entry of women into industry the *proportion* of female deaths has somewhat increased. In 1901–10 (Newsholme, 1923) there was in urban districts a peak age at 45 for men and at 35 for women, the male rate at those peak ages being 166 per 100,000 in excess of the female rate. In rural areas both sexes had a peak mortality at 25 years and the male excess was slight. The differences in the peak death rates between the sexes had been considerably reduced by 1938–9, being equal to a male excess of 25 per 100,000, but the male peak age had further advanced from 45 to 55 years.

These age and sex differences and changes are closely related to occupational causes. Before the industrial age women worked in the home and were exposed to infection from cases never isolated. Exposure to industrial conditions, especially silica dust, introduced a more chronic form of tuberculosis affecting men; lately the increase in the number of women in industry has increased their exposure to infection, and this was especially true in wartime; at the same time advances in the hygiene of the dangerous trades have tended to reduce the male excess. It would be of interest to know at the next census just what part of the male excess is attributable to the excess tuberculosis mortalities of these dangerous trades. Alcoholism plays a part in the excess male mortalities, but less so than in the past.

Results of Tuberculin-testing

One of the great advances in recent years in our knowledge of the epidemiology of tuberculosis arises from the increasing use of tuberculin for testing that sensitization of individuals which is caused by infection with the tubercle bacillus, whether natural or artificial. The refinements of the Mantoux test with its increasing test dosage of tuberculin have improved the sensitiveness of the method and rendered it superior to the von Pirquet test, which may be negative when the Mantoux test is positive. For this purpose old tuberculin, which contains two proteins of differing antigenic properties, is commonly used, but in the United States and Denmark P.P.D. (purified protein derivative) is in general use. In either case it is a test of allergic sensitization and not of resistance—much less immunity—but the parallelism between allergy and resistance appears to be sufficient to permit the measurement of the allergy as a rough test of the degree of resistance. It is unfortunate that owing to variations in the strength of the tuberculin used for testing —noticeably in Norway—the results of tuberculin-testing in one country are often not strictly comparable with those in another.

From the extended use of the Mantoux test it is now known that effective infection with *Mycobacterium* is not so widespread, especially in rural populations, as appeared to be the case early in the twentieth century, *pace* Naegeli, Burkhardt, and von Pirquet; later studies of Schuermann (1929) showed pulmonary lesions in only 1.7% of necropsies of those under 30 years of age and 11% of those between the ages of 30 and 45. Many negative tuberculin reactions are found among primitive communities (Topley, 1933), a high proportion of positives among most civilized communities, and a lower percentage of positives in the United States and Scandinavia, especially among those who, from rural location or economic shelter, have probably escaped contact with the bacillus. In Stockholm, states Heaf (1947), at 7–8 years only 8% were reactors and at 13–14 years only 26%. In Stavanger only 22.4% were positive at 10–20 years. In Denmark nation-wide figures show that two-thirds of the population are negative at 14 years; at 20–23 years the proportion is one-third (Holm, 1946). But in Scandinavia, where the use of B.C.G. is rapidly extending, the aim is to raise the proportion of positive reactors artificially. It is considered almost antisocial not to be tuberculin-positive.

The results of *x*-ray examinations largely confirm the results of the tuberculin tests. Holm states that a great part of those undergoing natural conversion show very prompt *x*-ray changes. Nevertheless the results of the Prophit Survey (1948) revealed that radiologically visible changes were seldom found when a recent primary lesion had caused a Mantoux-conversion from negative to positive—namely, 7.6% among nurses and 8.5% for London medical students. Malmros and Hedvall (1938) reported 13.9% of the naturally Mantoux-converted showing primary lesions. The Prophit Survey further states that the morbidity following primary infection was proportional to the degree of tuberculin sensitivity noted on natural Mantoux-conversion.

It should be the ultimate objective in tuberculosis control finally to eliminate these *natural* Mantoux-conversions. The Prophit Survey considers that "at the present stage of tuberculosis epidemiology it would be vain to hope to suppress all sources of infection and protect every person from even small infections. Nevertheless, no rational theory of prevention can be based on the theory that stray small infections produce a beneficial immunity. An entirely uncontrolled immunizing process responsible for many thousands of deaths can have no scientific support. Public health measures should therefore be directed to reducing exposure to a minimum. . . . Certainly even if occasional infection cannot at present be prevented much heavy repeated exposure is largely avoidable. The Prophit results have confirmed the importance of repeated exposure as one of the factors in the development of tuberculosis."

Obviously such a view excludes any belief that exposure to natural infection by bovine bacilli can serve any valuable purpose. The figures (Prophit Survey, 1948) relating to the marked decline in tuberculosis mortality in the United States at a time when bovine tuberculosis in cattle has been almost eliminated and pasteurization has become general show that the virtual elimination of infection by

bovine bacilli in man has not served to retard the concomitant fall in respiratory tuberculosis mortality.

But such a view will not be applicable to the use of avirulent tubercle bacilli for artificially increasing resistance to tuberculosis, of which the Bacille Calmette-Guérin is the only strain that has undergone prolonged test; still less would it apply to the vole bacillus, now under trial. Indeed, the Prophit Survey Report says: "Serious consideration should be given to the possibility of undertaking *in this country* [my italics] investigations into the vaccination of tuberculin-negative young adults, such as hospital workers, entering conditions of particular exposure." The same action is equally indicated in relation to any tuberculin-negative contacts of open cases of tuberculosis.

The Prophit Survey has also thrown light upon the vexed question whether tuberculosis in young adults represents infection, reactivation, or reinfection. The application of Mantoux-testing and radiography enables the first to be largely eliminated so far as the tuberculin-negative are concerned. Formerly much importance was attached to reactivation of old foci, but the proportion of cases of reactivation is possibly smaller than formerly believed. Reliable observations show it to be probable that reactivation of a calcified focus seldom occurs, as the bacilli contained therein are dead, though Blacklock (1947) was able to isolate bovine bacilli from calcified glands. This outlook stresses the importance of the prevention of massive and/or repeated infection.

Control of Contacts

In the prevention of infectious disease the *control* and immunization of contacts often play the most important part. The greatest attention has been given to the examination and *observation* of contacts of tuberculosis, but of control in the epidemiological sense there has been little in this country. In France and elsewhere the "œuvre de Grancher" consists in the removal of the infants of tuberculous parents—especially mothers—for an indefinite period. This can be regarded as a counsel of despair: the removal of the patient would appear to be the better plan if no other solution were possible. In Scandinavia the newborn infants of tuberculous parents are vaccinated at birth with B.C.G. and segregated for ten weeks or thereabouts because of the comparatively slow development of immunity in the infant; they are then returned to their homes. Heaf (1947) states that no vaccinated infant in any of the Scandinavian countries has so far succumbed to tuberculous meningitis or miliary tuberculosis. Contrast with this the figures relating to Black Notley Sanatorium, where the tuberculous mother is confined under the most favourable circumstances and is instructed in the prevention of infection of her child. Despite these precautions, of 11 children who were in contact with sputum-positive mothers four contracted tuberculosis and two died—i.e., 36% morbidity and 18% mortality.

There can be no question whatever about the importance of familial contact with tuberculosis. Deeny (1947) showed that in a town in Northern Ireland one-third of all the deaths from tuberculosis occurred in houses where there had been two or more such deaths. Opie and McPhedran's (1926) figures contrasting the rapid development of Mantoux-positive reactions in the child contacts of tuberculous patients in comparison with non-contacts fully demonstrate the importance of infection in the home. Stewart *et al.* (1937) obtained figures of the actual morbidity of contacts in rural areas of Tennessee. They showed that the incidence of subsequent cases in a tuberculous household was 2.06% in the year of onset, 1.33 in the first year following contact with the index case, 1.15 in the second, and lesser figures in the succeeding years.

We may conclude that in the causation of tuberculosis there is an uneasy balance between an increasing resistance—not to infection, but to morbidity and mortality, such resistance being partly racial or genetic, partly nutritional, the latter being closely related to the increase in the real value of wages during the nineteenth century—and massive and/or repeated infection, especially at susceptible ages, as in infancy, and later in adolescence and young adult life. Such massive infection has been greatly reduced throughout the past 80 years, and, speaking generally, increasingly so during the present century. The reduction of exposure in infancy results in an accumulation of susceptible tuberculin-negative adolescents and may cause a relative increase in tuberculosis in young adults because the risks of repeated exposure are much greater in the tuberculin-negative. This susceptibility can be overcome to a considerable extent by the production of artificial resistance. Silicosis, and possibly other adverse industrial conditions, may account for greater and later male mortalities compared with those of females.

Vaccination Against Tuberculosis

B.C.G. is a living avirulent strain of the bovine bacillus which, after 230 successive cultures over a period of 13 years, was employed in 1922 for the vaccination of children born in tuberculous families. It gives a "normal" tuberculin, but has never been recorded as having returned to virulence or produced a general infection in any of the more than 3,000,000 children said to have been vaccinated with it in the past 26 years. Nevertheless the Pasteur Institute has not yet accorded it the status of "virus fixe." All the cultures now used for inoculation are derived from this strain. The Lübeck tragedy was caused by the admixture of virulent bacilli with the B.C.G., and those responsible were convicted of gross carelessness. It is for this reason that B.C.G. should be produced in a laboratory entirely dissociated from other bacteriological work.

Recently by the kindness of Drs. Böe and Krohn I was enabled to see the Nasjonalforeningens B.C.G. Laboratorium in Bergen, where all the B.C.G. used in Norway is freshly prepared every week; the vaccine should be used within ten days of production, as it is apt to weaken owing to the death of the bacilli. It should therefore be kept in a refrigerator or ice-box. Two strengths are produced, clearly distinguishable by sight, one being obviously turbid and forty times as strong as the other. The stronger one is used only for transcutaneous inoculations. The more dilute emulsion is clear, and is employed for intradermal inoculation. Myren (1948) states that on a certain occasion the stronger emulsion was accidentally used for intradermal inoculation of 66 persons; localized ulceration was the only untoward effect, and the immunity produced appeared to be more durable than ordinarily. However used, it is important, as Holm (1946) points out, that the virulence of the B.C.G. strain should be kept at a proper level, and the bacteriologist at the B.C.G. Laboratory should be kept informed of the results of every inoculation.

The intradermal method has been more generally used, 0.1 ml. of vaccine being injected. It has the advantage that the dosage is more certain; it has the disadvantage that if through poor technique the injection is given subcutaneously a small localized abscess with enlargement of neighbouring lymph glands will ensue. Bacilli from such an abscess are, however, avirulent when cultured. Even so injected the discomfort is minimal and not incommoding.

The transcutaneous or multipuncture method does not suffer from this disadvantage. Birkhaug (1944) gives theoretical grounds for the belief that the skin itself is an antibody-producing organ. Birkhaug's original instrument

released forty needle-points automatically; its use has been given up in Bergen, and five or fewer applications of a holder fitted with eight gramophone needles are substituted. The skin is first cleaned with ether, the thick emulsion vaccine is then spread from a syringe with a needle, and the multipunctures are made. Statistical material is still being collected to evaluate this process. In Bergen, of 10,568 inoculated some 7,894 were controlled after two months; of these, 7,472 (94%) were Mantoux-positive. This result is in no way inferior to those of the intradermal method (personal communication). The objection that Birkhaug's instrument was difficult to sterilize has thus been overcome.

It is a strict rule that all persons must be Mantoux-tested before inoculation, and only those who do not react to 100 tuberculin units (Holm, 1946) should be inoculated. In a few cases men have been inoculated by accident during the allergic state without any untoward result—i.e., there is no negative phase, though an accelerated reaction may occur (Koch's phenomenon). The normal response is that at the end of three weeks raised papules appear at each puncture point. In six weeks a positive Mantoux reaction is usually obtained. In infants this may take ten weeks or even more. For infants 16 punctures, for women and children 24 punctures, and for men 40 punctures are given (Birkhaug, 1944). The use of B.C.G. involves not only the application of the vaccine in the appropriate way but also, if statistical fallacies are to be avoided, subsequent protection from virulent infection until sensitivity is demonstrated.

Results of Vaccination

So much for the methods; what are the results? Space does not permit a full description of even the better-documented experiences relative to but a small fraction of the 7,000,000 persons who have, according to Myers (1948), been vaccinated with B.C.G.; the majority of these have received the vaccine orally. The matter has been discussed by Holm (1946), Aronson and Palmer (1946), Wilson (1947), Heaf (1947), Levine (1947), Malmros (1948), Wallgren (1948a, 1948b), Rosenthal *et al.* (1948), and Aronson (1948). An Empire Conference in London, international conferences in Washington and Paris, and annual conferences in Scandinavia have taken place. The examples below—mainly from Scandinavia, where B.C.G. inoculation is practised on a national scale—are recorded for their apparent success. Given singly, they might not carry conviction to the critical mind; taken collectively, even the hypercritical cannot fail to reach the conclusion that in the varied circumstances the use of B.C.G. has been not merely harmless but endowed with marked protective properties.

1. In the Swedish district of Orebro (Malmros, 1948), in a population of 230,000 there have since 1942 been 22,413 vaccinated with B.C.G.—i.e., 8,040 newborn, 7,836 children over 1 year, and 6,537 adults. During the period 1942–7 only one vaccinated person has been regarded as tuberculous: a nurse, twice vaccinated, developed pleural effusion; there was no definite evidence of tuberculosis. This example does not provide a contemporary control.

2. The island of Bornholm, in Denmark. The comparison here is before and after a period of intensive testing and inoculation since 1945, by which time 10,337 young persons—i.e., 23.3% of the population—were vaccinated (Olsen, 1947; Malmros, 1948). A marked fall in the incidence of tuberculosis resulted at just the ages—namely, 7–35—at which vaccination took place. Notifications fell from 134 in 1935–40 to 82 in 1941–6. The proportion vaccinated is now 27%; 98% of those found tuberculin-negative and offered B.C.G. accepted.

3. Hyge's report on an outbreak in the Aurehoej State School in Denmark (Holm, 1946) has the force of a laboratory experiment, but was excluded by Wilson from his survey of the subject. The school had had Mantoux-testing followed by voluntary B.C.G. vaccination, the last tuberculin-testing being in December, 1942. The 368 girls were then in three classes: (*a*) naturally Mantoux-positive, (*b*) Mantoux-negative who had had B.C.G., and (*c*) Mantoux-negative who had not received it. Then in January and February, 1943, an influenza-like outbreak occurred, mainly affecting the unvaccinated Mantoux-negative. Suspicion of tuberculosis was aroused by the occurrence of a case of erythema nodosum. It was found that the source of infection was a teacher who had taught in an ill-ventilated classroom while suffering from a supposed "cold," though gastric lavage later revealed tubercle bacilli. Taking the 305 scholars in her class or classroom, the following results were found:

(A) 105 naturally positive. Four cases of genuine pulmonary tuberculosis. Morbidity, 3.8% ±1.95.

(B) 106 negative reactors given B.C.G. Two cases of genuine pulmonary tuberculosis. Morbidity, 1.9% ±2.6.

(C) 94 negative reactors. December, 1942. Seventy rapidly inverted to positive reactors. Of these 70 inverters 41 showed *x*-ray changes and 37 had tubercle bacilli; 55 had initial symptoms, 10 had pleurisy (3–11 months after infection), and 1 had peritonitis. Taking those with symptoms and *x*-ray changes, the morbidity was 43.6% ±10.6.

Among the 63 girls not using this classroom there was no illness, and none of the 11 Mantoux-negative reactors in this group became ill. These figures also bear out the belief, held in Scandinavia, that persons who have undergone Mantoux conversion after B.C.G. vaccination, if they *do* develop signs of tuberculosis, usually have a short illness of two or three months and can then leave hospital and have no relapse. Comparisons between A or B on the one hand and C on the other are statistically significant.

4. Heimbeck's figures (per 1,000 observation years) relative to the incidence and mortality of nurses at Oslo (Wallgren, 1948b):

	Morbidity	Mortality
B.C.G.-vaccinated	24·1	2·1
Non-vaccinated	141·2	14·6

5. Rosenthal's experience (Rosenthal *et al.*, 1948) with newborn children born in Chicago during ten years. The mothers were interviewed in the hospital and the children vaccinated before they left the hospital. Contrary to what is done in Scandinavia, no isolation of the child before or after vaccination was carried out.

	Non-Contact		Contact	
	Vaccinated	Control	Vaccinated	Control
Person-years and proved ..	5,627	6,032	517	284
Tuberculosis rate	1·95	6·46	3·86	17·60
Hospitalized	0·17	2·48	1·98	17·60
Deaths	1	7	0	4
Death rate	0·17	1·16	0	14·0
Deaths from other causes ..	27	22	3	2

Wilson (1947), after a lengthy review of the present position in regard to B.C.G., concluded that, whilst a presumptive case for the value of B.C.G. has been established, the documentary evidence is insufficient to estimate the degree of protection it affords, and he makes certain other criticisms which, in the opinion of Malmros and Wallgren, disregard much of the Scandinavian evidence quoted above.

In September, 1946, a conference on B.C.G. vaccination was held in the offices of the Tuberculosis Control Division of the United States Public Health Service in Washington, D.C. The deliberations of the distinguished leaders in tuberculosis from the United States and elsewhere concluded from the studies presented to the conference that B.C.G. vaccination confers increased resistance to tuberculosis for the limited period covered in those studies, and that medical literature reveals no proved cases of progressive disease as a result of B.C.G. vaccination, which can

be done without causing severe local reaction. In these studies B.C.G. converted a large percentage of non-reactors into reactors. The need for revaccination and the time interval between vaccination required further study. It was recommended that a single laboratory be established to produce vaccine for the whole country for use in research programmes prepared by the conference, but that it should not be produced commercially.

In America, with an economic outlook that is favourable in comparison with that of Europe and a falling tuberculosis mortality, an expectant outlook to B.C.G. may be permissible. In Scandinavia the question of the value of B.C.G. is now regarded as a *chose jugée*; it has definitely been adopted there on a national scale. In Norway B.C.G. vaccination is compulsory for certain grades of the population—e.g., the eighth-grade scholars. At the meeting of the Northern Tuberculosis Physicians in Oslo in July last the prevailing opinion was that all children ought to be vaccinated from infancy and that it should be repeated in childhood. It is difficult to become a nurse in Scandinavia without being Mantoux-positive or becoming so.

In this country the position is such that we cannot afford not to have available every resource in the combat against tuberculosis; we cannot possibly be complacent in our attitude towards its prevention. The control of contacts is gravely hampered: I have in mind a family of four children, successively infected from a tuberculous mother and all admitted to hospital, whose illnesses, according to Scandinavian experience, could have been prevented. With the shortage of nurses and of hospital beds at least those Mantoux-negative nurses who wish it should receive the degree of protection that B.C.G. affords. As a minimum programme B.C.G. should be prepared at a separate central laboratory, say in London, as is done in each of the three Scandinavian countries. It does not seem to be necessary to wait another five or ten years, by which time experiments may answer some of the remaining questions concerning B.C.G. vaccination, before it becomes available for more general use under conditions of control such as exist in Scandinavia.

Wells (1947) has vaccinated 121 persons with the vole bacillus, and has not observed anything but localized disease or any enlargement of lymph glands. He states that sensitivity to tuberculin following vaccination with the vole organism is greater and occurs earlier than that following B.C.G. Animal inoculation by itself will secure a fixed level of virulence. Tytler stated that its safety "appears unquestionable, but can hardly be greater than that which practice has proved for B.C.G." (See also Wells, 1946.)

If adequate control of contacts is to be carried out in this country the staff engaged in the purely preventive side of tuberculosis control must be augmented. If from largely being observers they are to be engaged in actively producing immunity their numbers should be at least doubled. In Scandinavia the proportion of tuberculosis officers, measured either by population or by number of cases, is everywhere considerably higher than in Great Britain. When the people are ready to accept vaccination we should be ready to give it. We need a "new look" in tuberculosis control.

Summary

The great decline in tuberculosis mortality that occurred in the later two-thirds of the nineteenth century was caused mainly by improvement in socio-economic factors of which the rise in the real value of wages is the best gauge. This rise in value resulted from the increasing productivity of machines; it facilitated better nutrition and housing, and in the home it involved a lessened exposure of women, and more especially children, to infective cases. For a period bad conditions in industry weighted the conditions against men, silicosis causing a high mortality in later male life; the male deaths now considerably exceed the female.

In 1911 a factor previously unimportant followed sanatorium benefit, which provided accommodation for the segregation of earlier cases and became increasingly effective. Previously the deaths in Poor Law hospitals took place there largely as a result of destitution. Despite the pause in the rise in the real value of wages—becoming an actual decline in each of the two wars—the tuberculosis death rate continued to fall—markedly so in tuberculous meningitis in infancy and childhood. It is assumed that this was mainly due to the segregation of infective cases, though improved treatment was not without result. Largely owing to the shortage of nurses, this factor was inadequate during and after the last war and can no longer be relied on. In Scotland tuberculosis mortality is increasing, largely among young adults.

Family contacts of known cases form at least one-third of cases of tuberculosis, and the infection of nurses is a serious defect in our present system. Vaccination with B.C.G. (or the vole bacillus) appears to meet present pressing needs, especially as a preventive for the two classes just mentioned. Twenty-five years' experience of B.C.G. has shown it to be harmless; it is universally adopted in Scandinavia, where its use—compulsory in Norway—has led to a marked decline in incidence and mortality among those receiving it. It is recommended by the World Health Organization that it should be provided free; it should be produced centrally and be used, in the first instance, for the prevention of tuberculosis among known contacts of cases.

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AN ANALYSIS OF 200 CASES OF ANKYLOSING SPONDYLITIS

BY

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In this paper is presented an analysis of 200 cases of ankylosing spondylitis, together with a review of some current ideas on the disease. No attempt is made to cover all its aspects, since the historical and other features have been adequately described by others, notably by Buckley (1945). Data were obtained from the hospital notes of cases admitted to the Royal National Hospital for Rheumatic Diseases, Bath, during the period 1938–48. These do not represent the total number of cases admitted during this period. The records for a number of years were lost as a result of enemy action, and in many other cases the notes were found to be inadequate. Apart from this no selection of cases was made, and the figure was limited to 200 for statistical purposes. All were proved cases of ankylosing spondylitis from both a clinical and a radiological standpoint.

Results of Investigation

Sex Incidence.—There were 158 (79%) males and 42 (21%) females. This percentage of women is higher than has been recorded by other workers, with the exception of Swaim (1939), Gilbert Scott (1942), and Fletcher (1944).

Age of Onset.—The incidence is shown in Table I. In no case did the onset occur before the age of 10 years and in only three cases was it before 15. The results are in conformity with those found by Buckley (1935) and other observers, except that a rather larger number of cases occurred between the ages of 15 and 20.

TABLE I.—*Age of Onset*

Age	No. of Cases	Percentage
10–20 years	42	21
20–30 ,,	80	40
30–40 ,,	45	22·5
40–50 ,,	21	10·5
50–60 ,,	11	5·5

In one case the age of onset was not recorded.

Initial Diagnosis.—Only 102 (51%) of the cases were admitted to this hospital with a correct diagnosis already made. This lends further weight to the suggestion of Gilbert Scott (1942) that *x*-ray examination of the sacro-iliac joints should be a routine investigation in all cases of persistent low-back pain.

Associated Factors

Sepsis.—There was a history or evidence of focal sepsis in 22 cases. This did not include dental caries without abscess formation. The sites of focal sepsis were catholic in distribution, and only three were confined to the pelvis. This is of interest in view of the suggestion made by Buckley (1945) of the importance of infection from the pelvis in this disease.

Trauma.—Thirty (15%) patients gave a history of trauma, which they associated in some way with the onset of symptoms. This trauma varied in severity and anatomical distribution, and the assessment of its significance has proved impossible.

Exposure to Excessive Fatigue and Shock.—Thirteen (6.5%) cases gave a history of this, but taking into consideration the war years and occupational hazards this was not regarded as extraordinary or significant.

Childbirth.—Five of the 42 women patients stated that their symptoms dated from the birth of a child. Others were unaffected by childbirth. A follow-up of this finding might be profitable in view of the pelvic trauma and the physiological changes in the sacro-iliac joints at parturition.

Family History.—In only two cases was there a family history of ankylosing spondylitis. In three cases there was a family history of gout, and 31 revealed a family history of acute or chronic rheumatism.

Past History.—There appeared to be no significant relation between any previous illness and the condition. In only 18 cases was there a history of fibrositis or other rheumatic condition, and in certain of these cases the nature of the complaint seemed vague and of no statistical value.

Occupations.—These were classified as: (1) occupations involving physical effort—heavy 41 (20.5%), medium 92 (46%), or light 32 (16%), and (2) sedentary occupations 30 (15%). In five cases it was not recorded. In this series occupation appears to have little relation to the aetiology of the disease.

Iritis.—In 12 (6%) cases iritis was found. Campbell (1947) and Fritz (1937) report a higher incidence.

Subcutaneous Nodules.—In no case, in spite of a diligent search, were nodules found. In view of their incidence in rheumatoid arthritis this is significant.

Chest Expansion.—In five patients this was more than 3 in. (7.5 cm.), in 20 it was between 2 and 3 in. (5 and 7.5 cm.), in 22 between 1½ and 2 in. (3.75 and 5 cm.), in 27 between 1 and 1½ in. (2.5 and 3.75 cm.), and in 52 less than 1 in. In 74 cases it was not recorded. The vital capacity was estimated in 15 cases with the following results: 5,000–4,000 ml., 1; 4,000–3,000 ml., 2; 3,000–2,000 ml., 5; and below 2,000 ml., 7. In the majority of cases great improvement was noted before discharge. This supports the value of institutional treatment with adequate physiotherapy, especially breathing and postural exercises, and the use of a plaster bed in the acute stage.

Loss of Weight.—Initially 108 (54%) patients were found to have lost weight, in 26 (13%) there was no loss, and in 66 (33%) this point was not recorded.

Type of Onset.—In 62 (31%) cases the onset was acute and of such severity that the patient was confined to bed; in 114 (57%) it was insidious, usually over years; and in 24 (12%) the type of onset was not recorded.

Initial Symptoms.—These consist of pain and/or stiffness; the site in order of frequency is shown in Table II.

TABLE II.—*Initial Symptoms*

Site	No. of Cases	Percentage
Low back	75	37·5
Low back and other sites	33	16·5
Hips	23	11·5
Low back and hips	20	10·0
Knees	15	7·5
Sciatic pain	12	6·0
Feet and ankles	6	3·0
Cervical spine	5	2·5
Dorsal and cervical spine	4	2·0
Dorsal spine	3	1·5
Hips and knees	1	0·5
Cervical and knees	1	0·5
Shoulders	1	0·5
Unrecorded	1	0·5

Corrected Suspension Stability and Sedimentation Rate.—Abnormal readings at some stage were found in 182 (91%). The grossly abnormal readings were seen when the disease process appeared to be most extensive and most active.

It is our impression that nearly all cases of ankylosing spondylitis will show an abnormal corrected suspension stability and erythrocyte sedimentation rate during the active phase of the disease. The figures obtained in many cases were very abnormal, even more so than those we usually see in rheumatoid arthritis.

Haematocrit.—In 154 (77%) there was a low haematocrit reading. This is in conformity with the view that cases of ankylosing spondylitis show a secondary anaemia during the active phase. Red cell counts supported this in the great majority of cases. White cell counts showed little gross abnormality, but Arneth counts revealed a shift to the left in 20 out of 24 recorded cases.

Blood Proteins.—Plasma protein estimations in five cases showed little gross abnormality except an occasional high total protein figure and a consistently high value for fibrinogen. Albumin, globulin, and the A./G. ratio were always within normal limits. This is in conformity with a larger series done recently in this centre. These results are in contradistinction to the findings in rheumatoid arthritis, in which abnormal plasma proteins were found in approximately 50% of cases (Simpson and Hall Brooks, 1948).

Plasma Uric Acid and Blood Uric Acid.—These were estimated in 178 (89%) cases and were normal in all except four cases in which the figure was slightly raised, but the plasma uric acid was never above 7.5 mg. per 100 ml.

Wassermann and Kahn Tests.—At least one of these tests was done in all cases, and without exception the result was negative.

Alkaline and Acid Phosphatase.—In only 27 cases were these results recorded and in only four were the readings raised—in two the acid phosphatase was 7 and 6.6 units, and in the other two the alkaline phosphatase readings were 15 and 11.5 units (King method). This is in conformity with the opinions expressed by Desmarais (1948), and is of interest in view of the findings of McWhirter (1945) and others.

Muscle Biopsies.—This investigation was carried out in 18 cases and none showed the changes found in rheumatoid arthritis. Muscle biopsies performed in this hospital on cases other than in this series also showed no abnormality as seen in rheumatoid arthritis (Desmarais, Gibson, and Kersley, 1948).

Aurotherapy.—Thirty-six patients had been given courses of gold—20 showed no subjective or objective improvement, in nine there was some subjective improvement, and in seven the results were not recorded.

X-ray Therapy.—It is our custom to give a series of six applications, each of 225 r, in a period of two to three weeks to each affected part. Of 99 cases receiving such treatment 68 showed improvement. This consisted chiefly in relief of pain and stiffness. We find it difficult to say whether the disease process was ever arrested, but we are at present engaged on a follow-up of patients from this point of view and hope to publish the results in the near future. Fourteen cases were not improved from the point of view of pain or any other symptoms. In 17 cases the result was not recorded. We consider that the result of deep *x*-ray therapy, especially the relief of pain, justifies this form of treatment in all cases, and that it should be initiated as soon as possible.

Radiographic Findings

For the sake of convenience we divided our results into four types (Table III). In type 1 bony ankylosis had occurred, in type 2 gross changes but no ankylosis were found, type 3 showed osteoporosis or other minimal changes alone, and in type 4 there was no abnormality.

TABLE III.—*Analysis of X-ray Findings*

	Total	Type 1	Type 2	Type 3	Type 4
Sacro-iliac joints	173	155	18	0	0
Lumbar	167	138	7	16	6
Dorsal	120	75	10	23	12
Cervical	88	65	7	4	12
Hips	141	28	46	27	40
Shoulders	12	0	2	9	1
Knees	14	4	4	5	1
Hands	32	0	2	11	19
Feet	4	0	0	3	1
Ankles	1	0	0	1	0
Symphysis pubis and ischium	21 showed "woolliness"				

Discussion

Certain workers, notably in the U.S.A., favour the concept that the disease is a variant of rheumatoid arthritis (Boland and Present, 1945; Lennon and Chalmers, 1948). From a study of this series of cases we regard it as a separate entity. Our reasons for so doing are: (1) in no case has a subcutaneous rheumatic nodule been found; (2) muscle biopsies have never shown the changes associated with rheumatoid arthritis; (3) plasma protein values are not similar to those seen in rheumatoid arthritis; (4) the high incidence in males, the beneficial effect of deep *x*-ray therapy, and the ineffectiveness of chrysotherapy are unlike the findings in rheumatoid arthritis; (5) the *x*-ray appearances as seen in the spine, hands, and other joints are unlike those normally seen in typical rheumatoid arthritis; and (6) permanent deformities typical of rheumatoid arthritis were not present in the hands or feet in any case in this series.

In 75 (37.5%) cases the initial symptom was pain and/or stiffness in the low back. In 53 (26.5%) other cases symptoms were referable to the low back and other sites concurrently. Initial peripheral joint involvement (elbows, wrists, hands, knees, ankles, feet) accounted for 21 (10.5%) cases. In 12 (6%) peripheral joint involvement occurred initially in combination with involvement of other joints. This is of interest in view of the findings of peripheral joint involvement by Boland (1946) and Boland and Shebesta (1946), whose figures vary between 18 and 30%.

An analysis of our *x*-ray results shows agreement with the views expressed by other authorities, especially Steven (1947). It will be noted that bony ankylosis had occurred in 155 of the 173 cases in which *x*-ray films of the sacro-iliac joints were available. This shows that in the majority of our cases we were dealing with the advanced stage of the disease, but earlier *x*-ray films were available of a certain number of these cases before ankylosis had occurred. We are agreed that the earliest changes seen radiologically are osteoporosis of the affected bones (sacrum and ilium) and a subarticular zone of osteosclerosis. We are not clear which of these changes is primary or whether they occur simultaneously.

The next most frequent site to be involved is the lumbar spine. There was no case in this series in which we found involvement of the lumbar spine without involvement of the sacro-iliac joints. In one case, in the early stages, unilateral involvement of the sacro-iliac joints was seen; later films revealed bilateral changes. We are impressed with the frequency with which the articulation between D12 and L1 is involved. This probably is secondary to the considerable stress at this joint.

The radiological changes at other sites generally corresponded with the severity of the disease and the location of the symptoms. In only two of the 32 cases in which the hands were *x*-rayed was there evidence of extensive changes. These consisted of translucent areas in the shafts of the metacarpals and phalanges (unlike the erosions seen

in rheumatoid arthritis), together with a generalized osteoporosis. In 11 cases osteoporosis alone was seen, and in 19 nothing abnormal was detected. The osteoporotic and other changes were associated with a severe and widespread phase of the disease, but in no case did we see changes characteristic of rheumatoid arthritis.

The biochemical and haematological data are self-explanatory and agree with the findings of other workers.

Summary

Two hundred cases of ankylosing spondylitis are reviewed.

Sex incidence, age of onset, associated factors, accuracy of original diagnosis, occupation, and family and past histories are enumerated.

The original symptoms and type of onset are described, as are the biochemical and haematological findings.

The nature of the disease process is discussed, especially in its relation to rheumatoid arthritis, and we conclude that it is a separate entity.

The analysis of the *x*-ray findings is discussed.

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SIGNIFICANCE OF CLUBBING OF THE FINGERS

BY

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Perhaps we are rather too apt to regard clubbed fingers as dire omens. Lovibond (1938) stated: "The discovery of clubbed fingers is condemning to the patient . . . long known to be associated with grave disease." Familial clubbing, however, without clinical significance, in which the inheritance is of Mendelian dominant type, is well recognized (Horsfall, 1936; Seaton, 1938; Mendlowitz, 1942; Davis, 1946), although Witherspoon (1936) found only 14 families reported in the literature. Mendlowitz gave an exhaustive list of conditions associated with clubbing, at the same time pertinently remarking that "mere coincidence in isolated cases is not sufficient evidence of a causal relationship." Among associated conditions of less serious import he included simple deformities of the chest wall and uncomplicated emphysema and bronchitis, although these associations were rare. He even quoted "idiopathic," apparently non-familial, cases in quite healthy people (Campbell *et al.*, 1938; Becher, 1941).

In the course of a few months several people were seen whose fingers and toes were clubbed but who suffered from no ominous disease. Brief examples follow.

Cases without Ominous Disease

Case 1: Chest Deformity (? Congenital).—A soldier aged [illegible] was admitted to hospital with tonsillitis. His fingers and [illegible] were markedly clubbed. He was sure that they had alw[illegible] been that shape, but knew of no similar ones in the fam[illegible] He had no history, symptoms, or signs of lung or heart dise[illegible] and all investigations were negative. He also had a deform[illegible] of the chest wall on the right side involving ribs 6, 7, and [illegible] which were concave in the anterior axillary line, producin[illegible] considerable hollow. This had also been present all his life.

Case 2: Familial.—A sergeant-major was admitted to hosp[illegible] for investigation of his headache (migrainous). He had g[illegible] clubbing of the fingers and toes, and also an apparently conge[illegible] tal varus deformity of the fifth toes. There was no histo[illegible] referable to chest complaints; full investigations were ne[illegible] tive, and had been so previously at another hospital. He kn[illegible] he had had clubbing for at least 20 years, and said that his s[illegible] aged 2, had had exactly similarly shaped fingers and toes sin[illegible] birth. Another interesting fact was that three of his sist[illegible] were said to have died from pneumonia. There was no tuberc[illegible] lous disease in the family.

Case 3: Familial.—A man aged 41 was admitted for inve[illegible] gation of his dyspepsia. He had no history of chest disea[illegible] but his fingers and toes were clubbed. His two children, a[illegible] 5 and 2, were normal in this respect, but his mother's di[illegible] were also clubbed. He had no brothers or sisters.

Case 4: No Apparent Associated Condition.—A middle-a[illegible] man came to the out-patient department with a fractured fing[illegible] All his fingers were clubbed and, he thought, had always b[illegible] so shaped. He had no history or symptoms of medical disea[illegible] investigations were negative, no congenital abnormalities w[illegible] discovered, and there was no family history of clubbing.

Case 5: Emphysema.—A man aged 62 was admitted f[illegible] investigation of his sciatic pain. For many years he had h[illegible] some winter cough and shortness of breath. He had clubb[illegible] fingers and toes and fairly marked emphysema, but no disea[illegible] of the chest beyond this could be discovered after f[illegible] investigation.

Case 6: ? No Associated Condition.—An airman aged 21 w[illegible] admitted with mild febrile laryngitis and bronchitis. He rapid[illegible] recovered, but continued to complain of a cough, which w[illegible] quite dry, some shortness of breath, and vague chest pai[illegible] There were no abnormal signs whatsoever except for clubbi[illegible] of the fingers, which had been present at the beginning of h[illegible] mild illness. Full investigations were negative.

Case 7: Chronic Bronchitis.—An airman aged 36 co[illegible] plained of a chronic cough all the year round since he was l[illegible] when he had had pneumonia. He had some white sputu[illegible] in the mornings and some dyspnoea on exertion. Examinatio[illegible] revealed nothing at all beyond gross clubbing of the fingers a[illegible] toes. Bronchography was normal.

Case 8: Past Chest Disease.—An airman aged 30 gave [illegible] history of pneumonia at the right base at the age of 5. Wh[illegible] 17 he had been in a sanatorium for six months with tubercul[illegible] of the right lung, which had been pronounced cured, and t[illegible] patient had remained tubercle-free since. He had had rat[illegible] doubtful attacks of "bronchopneumonia" (? site) since t[illegible] and frequent bronchitis with greenish sputum but no blo[illegible] On examination he was undersized—5 ft. 6 in. (1.68 m.) [illegible] height—and looked much younger than his 30 years. He h[illegible] clubbed fingers and some flattening of the right suprascapul[illegible] region only. *X*-ray films of the chest and bronchography w[illegible] perfectly normal.

Comment.—Certain points arise. In Case 1 the clubbi[illegible] might be the result of the congenital chest deformity; h[illegible] might it not be an associated congenital abnormality ? especially as Case 2 also showed a congenital skele[illegible] deformity which could only be an associated conditi[illegible] Could there be any relation between the familial clubbi[illegible] in Case 2 and the sisters' pneumonia ? Case 8 was interes[illegible] ing in that the clubbing was presumably related to p[illegible] chest disease, had not subsided with healing of the lung[illegible] and was associated with infantilism. Case 6 had bee[illegible]

diagnosed as having bronchiectasis, had been down-graded to 3, and his discharge from the R.A.F. had been recommended at another hospital. We found no evidence in support of this diagnosis and did not act on the recommendation. Case 7 was also incorrectly labelled "bronchiectasis." This seems to be the important point arising from these cases—namely, that a chronic cough and clubbed fingers are not sufficient for a diagnosis of bronchiectasis, with its consequent gloomy prognosis, although it is apparently not rare for this combination to be so evaluated without exclusive investigation having been made.

Cases with Unusual Features

Other cases showing clubbing that were seen in the same period seem worthy of note because of unusual features.

Case 9: Rheumatic Heart Disease.—A boy aged 8 was admitted with chorea. Two years previously he had had the same malady. There were perfectly typical physical signs of well-established aortic incompetence and mitral stenosis, but there was no suggestion of congenital heart disease in his history or on physical or radiological examination. His fingers and toes were markedly clubbed. There were no signs of heart failure. His parents had not noticed the unusual shape of his fingers until it was pointed out to them. There was no family history of clubbing.

Case 10: Cardiac Failure.—A man aged 53 was admitted to hospital in a state of congestive heart failure, with bilateral hydrothorax. His history of shortness of breath went back six months. There was no history of cough or of previous chest trouble. He showed early but definite clubbing of the fingers. The cause of the heart failure was doubtful; there was no evidence of valvular disease and the blood pressure was not raised, although the apex thrust was beyond the nipple line. After aspiration of the chest and routine treatment an *x*-ray film of the lungs was entirely clear except for rather heavy root markings.

Comment.—Chronic congestive heart failure with mitral stenosis is an established cause of clubbing and was described by Thorburn in 1893, but clubbing in other types of failure without congenital lesions, and clubbing associated with rheumatic heart disease without failure, must be rare. Could the hydrothoraces in Case 10 be the salient factor in its development?

Case 11: Primary Lung Cancer.—A sailor aged 46 was admitted with the symptoms and signs of a space-occupying lesion in the left post-Rolandic area of the brain. Otherwise he had no complaints or physical signs except for clubbing of his fingers. An *x*-ray film of the chest showed a small faint round shadow in about the centre of the left lower lobe. At necropsy this shadow was found to have been caused by a primary carcinoma no bigger than 1 in. (2.5 cm.) in diameter. There were secondaries in the brain, but the lungs were otherwise normal. That so small a lesion should have produced clubbing is yet a further argument against the operation of a mechanical pulmonary factor in the production of this condition. Similar cases have been previously reported (Mendlowitz, 1942).

Case 12: Infective Hepatitis.—A boy aged 8 was admitted with typical mild infective hepatitis. His liver was palpable and he was moderately jaundiced. His fingers were normal on admission but showed marked clubbing after a fortnight. Unfortunately I do not know what happened to him later. Although hepatitis is a recognized uncommon cause of clubbing, such rapidity of development is rare in conditions other than empyema and lung abscess.

Summary

Some cases of clubbed fingers with certain unusual features are briefly reported. It is particularly stressed that clubbing by itself may be of little significance, and when combined with chronic cough is not sufficient to justify a diagnosis of bronchiectasis, although measures should certainly be taken to exclude this possibility.

It is realized that only one of these cases came to necropsy for final confirmation; but, clinically and from a practical standpoint, there was no doubt about the correctness of the interpretations.

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A CASE OF CONGENITAL TUBERCULOSIS

BY

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In previous reviews of the literature of congenital tuberculosis (Beitzke, 1935; Hughesdon, 1946), only eight cases of which appear to have been reported in this country up to 1946, the difficulty of proving the congenital origin of the disease has always been stressed. This difficulty is usually all the greater because important evidence is often lost through the destruction of the placenta at the time of birth. Proof of many of the cases reported has therefore had to rest on circumstantial evidence and on the exclusion of possible extrauterine causes of infection. Dorothy Price (1948) has laid down three requirements for establishment of the congenital origin of the tuberculous infection; they are, (1) proof of tuberculous infection in the mother, (2) demonstration of tuberculous infection in the child, and (3) exclusion of the possibility of infection of the child after birth.

It has been customary to group cases of congenital tuberculosis into two main types—those in which infection reaches the foetus via the umbilical vein, and those in which it arises from infected amniotic fluid. This second mode of infection usually occurs through ingestion of such fluid by the foetus, in which case the primary seat of the disease is in the intestinal tract, resulting in enlargement of the mesenteric glands and later of the glands of the porta hepatis. It has also been maintained that infection from amniotic fluid may be caused by aspiration of the fluid into the air passages. The view that the foetal lung is normally capable of respiratory movement, so that amniotic fluid may enter the alveoli, as maintained by Snyder and Rosenfeld (1937), has been contested by Whitehead *et al.* (1942), who showed that in guinea-pigs this did not occur. They observed that, *so long as anoxial conditions were avoided,* thorotrast injected into the amniotic fluid was not aspirated into the lungs. Thus the view that congenital tuberculosis may have its origin in aspiration of infected fluid, except possibly during parturition, must at least be open to doubt.

Hughesdon (1946), in a review of 35 cases described between 1935 and 1945, states that the average duration of extrauterine life was 36.5 days in those cases in which it was stated. A few of the patients lived for a considerably longer period. In every case the tuberculous lesions found at necropsy were commensurate with an infection of much longer standing than the duration of extrauterine life.

Almost all such cases showed at necropsy a miliary bloodstream spread of the disease irrespective of the mode of origin of the infection.

In their clinical course most of the cases of the ingestion type of infection have shown a certain similarity; at birth the child appeared to be normal and for a time gained weight, but later loss of weight, diarrhoea, and sometimes jaundice appeared, and death rapidly ensued in a few days. The case reported below followed such a course. Both the infant and the mother died within a short time of each other, and in both cases a post-mortem examination was carried out.

Case Record

A woman aged 31 was discovered on routine antenatal examination in October, 1947, to be suffering from pulmonary tuberculosis. She was admitted to Grove Park Hospital on Oct. 25, and subsequently was transferred to Lewisham Hospital, where there is a special unit for tuberculous patients in the obstetric department. She was delivered on May 2, 1948. Labour was spontaneous and lasted 15¼ hours, but was accompanied by a severe post-partum haemorrhage of about 3 pints (1.7 litres). The placenta was expressed but was incomplete, the small remaining portion being removed from the uterus four hours after completion of the second stage. No other abnormality of the placenta was observed. The infant was immediately isolated from the mother, who on the day following delivery developed a pyrexia ranging between 99.6 and 102° F. (37.55 and 38.9° C.). The mother died about three weeks later.

The infant was a full-term male child, apparently quite healthy. Its weight at birth was 8 lb. 14 oz. (4 kg.). Progress was satisfactory, and on the seventeenth day he was transferred to a nursery, routine medical examination at this time revealing no abnormality. On the twenty-second day it was observed that he was taking his feeds poorly and was lethargic, and the temperature had risen to 101.6° F. (38.7° C.). The abdomen was distended and there was a mild degree of jaundice. On the twenty-sixth day he was transferred to hospital, where on examination the temperature was found to be slightly raised, the abdomen distended, and the spleen greatly enlarged, extending downwards into the left iliac fossa. The liver was also somewhat enlarged, and the sclerae and skin were slightly jaundiced. The infant was not dehydrated. A blood count at the time showed: red cells 3,300,000 per c.mm.; haemoglobin, 64% (Haldane); white cells, 11,100 per c.mm. (56% polymorphonuclear leucocytes, 36% lymphocytes, and 8% monocytes); there were also a small number of primitive red cells. The blood Wassermann reaction was negative.

While in hospital the difficulty of getting the child to take his feeds persisted, the jaundice became deeper, and the stools were relaxed and offensive. Four days after admission—that is, thirty days after birth—he died.

All the staff who came into contact with the infant, both in the hospital in which he was born and in the nursery to which he was subsequently removed, were later examined radiologically for tuberculosis, with negative results.

Pathological Reports

Post-mortem Examination of the Mother.—Generally disseminated tuberculosis; tuberculous peritonitis and salpingitis; chronic pulmonary tuberculosis:—Cavities (up to 2 cm. in diameter) with adjacent fibrocaseous nodules in upper lobes of both lungs. Numerous miliary granulomatous tubercles in lungs. Dense fibrous adhesions at left apex, obliterating left pleural cavity. No macroscopic tuberculous infection in hilar lymphatic glands. Bilateral chronic fibrocaseous tuberculous salpingitis: caseous material in lumina of fibrotic Fallopian tubes; subinvolution of uterus, compatible in size with a four-months pregnancy; slight purulent endometritis with fibrin and blood clot still attached to the shrunken placental site. Slightly serous caseogranulomatous tuberculous peritonitis, with adhesions between the loops of intestine. Granulomatous tubercles in posterior abdominal lymphatic glands. Miliary granulomatous tubercles in spleen, kidneys, and liver. Slight subendocardial fatty change in ventricular walls of heart. Slight congestion of surface of brain. No abnormalities in stomach and intestines and endocrine system. Physiologic activity of breasts. A slightly wasted, well-developed wom

The chief findings included chronic bilateral pulmona tuberculosis and cavitation with superadded terminal miliar tuberculosis. In addition there was a chronic bilateral tubercu lous salpingitis, which had almost certainly been present duri at least the latter few months of the last pregnancy, and a m recent generalized hyperplastic tuberculous peritonitis.

Post-mortem Examination of the Infant (Dr. A. B. Bratton). *Generally disseminated tuberculosis; caseous tuberculosis lymphatic glands in hilum of liver*:—A wasted, well-develop infant showing slight jaundice of sclerae. Mass (2.5 cm. diameter) of caseous lymphatic glands in hilum of liver; small caseous, coeliac, para-aortic, and lumbar glands; caseous glan (up to 1.5 by 0.7 cm.) at bifurcation of trachea and in hila both lungs. Very numerous caseous nodules varying from pin's head to 1.6 cm. diameter in enlarged spleen (7.5 by 5 4.5 cm.) (see Fig.). Caseous tubercles up to 0.2 cm. diame

Photograph of the child's spleen, showing the large caseous are and enlarged lymphatic glands in the hilum.

and submiliary granulomatous tubercles scattered through live A few submiliary granulomatous tubercles in and cloudy swel ing of kidney. Two caseous foci (largest 0.4 cm. in diamete in lower lobe of right lung and one in lower lobe of left; a fe miliary granulomatous tubercles and an occasional area o caseating bronchopneumonia in rest of lungs. Cloudy swellin of myocardium. Oedema of pancreas. No abnormality i adrenals, stomach, intestines, bladder, prostate, or testes Oedema and congestion of brain.

The lesions in the spleen and lung contained masses of acid-fast and alcohol-fast bacilli in Ziehl–Neelsen stained sections. Many of the lesions were advanced and appeared to be at leas a month old. No primary focus was found in any of the usual sites. The most severe lesions were in the glands in the hilum of the liver; these had caused jaundice by pressure on the bile ducts.

Comment

We consider this case to be one of congenital tuberculosis for the following reasons: (1) The clinical course of the child's extrauterine life was similar to that of other cases recorded. (2) Post-mortem examination showed tuberculous lesions commensurate in size and distribution with intrauterine infection. Whether these were due to blood-borne infection through the umbilical vein or to ingestion of infected amniotic fluid is uncertain, but infection was more likely to have been through the former route, as the glands in the porta hepatis were those most enlarged. (3) Post-mortem examination of the mother subsequently revealed active genital tuberculous lesions, which were certainly present during the latter part of the intrauterine life of the child. (4) Immediate removal of the child from contact with the mother and failure to find any subsequent source of tuberculous infection among members of the

staff attending the child make it almost certain that the mother was the source of infection.

We wish to thank Dr. C. D. Coyle, medical superintendent, Archway Group of Hospitals; Mr. Alistair Gunn, consulting obstetrician, and Dr. Simmons, senior physician, Lewisham Hospital; and Dr. A. B. Bratton, senior pathologist, Archway Group Histological Laboratory, for the use of their records of the cases. We also wish to thank Dr. S. M. Tracey, assistant M.O.H. of St. Pancras, for x-raying the staff of the nursery, and Dr. A. L. Jacobs, senior physician, Archway Group of Hospitals, for his helpful criticism.

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THE MEAT RATION AND BLOOD LEVELS

INVESTIGATION OF INDIAN SOLDIERS IN PERSIA AND IRAQ, 1944

BY

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The striking contrast between the vegetarians and the meat-eaters of the Indian soldier population at Shaiba (Iraq) in the incidence, severity, and type of anaemia suffered (Taylor and Chhuttani, 1945) promoted an investigation into the blood levels of the apparently healthy men on full duty.

The garrison had about 17,000 meat-eaters and 1,188 vegetarians. Two units (S and B), each with a strength of over 500 men and well over 50 vegetarians, were chosen because among the vegetarians in unit S the incidence of nutritional macrocytic anaemia was high whereas unit B was the only major unit without a single case of anaemia for at least a year previous to the time of the investigation. The material was not selected, any two meat-eating and vegetarian soldiers being sent each day by unit authorities from among those who were doing full duties.

Blood was taken in oxalated flasks from the vein first thing in the morning, before breakfast, and sternal puncture was performed at the same time. In addition to a full clinical examination, including search for signs of malnutrition, stools were examined for helminthic and protozoal infection in all cases. The haematological investigations were carried out in the field laboratory attached to the hospital by the workers who had done the anaemia cases; they were not aware of the clinical features or the dietetic habits. Cytological nomenclature and the haematological technique of the earlier investigation were adhered to (after Napier and Das Gupta, 1942). The erythrocyte sedimentation rate was estimated by Wintrobe's tubes before spinning them for corpuscular volume estimation.

Forty meat-eaters and forty-two vegetarians from unit S were examined during August–November, 1944. The inquiry had to be suspended when twelve unit B men from each batch had been examined; the data yielded by this unit are thus referred to for one significant feature only. Men from unit S had been in Shaiba for one and a half years and the majority were from United Provinces of India.

The meat-eaters and the vegetarians were served from the same kitchens. The vegetarians had never taken meat or eggs in their whole life. We often visited unit S camp to acquaint ourselves with the living, eating, and working conditions of the two dietetic groups; these were found to be alike in all respects except that the vegetarians on account of their social customs did not consume the weekly ration of 20 oz. (570 g.) of fresh mutton. The unit was carrying out pioneer duties of a heavy nature entailing a 44-hour week.

The daily rations were: 18 oz. (510 g.) of atta (wheat flour) or rice, 2½ oz. (70 g.) of dal (pulses), 3¼ oz. (92 g.) of ghee (clarified butter or vegetable oil), ⅔ oz. (19 g.) of condiments, 2 oz. (57 g.) of onions, 2 oz. of potatoes, 4 oz. (114 g.) of fresh vegetables, 2 oz. of unsweetened tinned milk, and 6 oz. (170 g.) of fresh mutton with bone for five days in the week. Leafy vegetables were issued for only a few months of the year. In lieu of fresh meat vegetarians were allowed 4½ oz. (128 g.) of tinned milk three days a week and ¾ oz. (21 g.) of ghee and 3 oz. (85 g.) of atta or rice for two days a week, but none of the vegetarians of unit S had received these. No one had supplemented his rations from canteen or elsewhere. The meat ration of 6 oz. of fresh mutton with bone for five days a week amounted to 4 oz. without bone; this was checked in local carcasses. The total daily intake was over 3,000 calories and over 80 g. of vegetable protein.

Haematological and Clinical Features

Peripheral Blood

The various averages obtained are shown in Table I. The average means of red cells and haemoglobin were significantly higher among meat-eaters than among vegetarians (5,550,000 and 4,670,000; 15.44 and 14.32 g.).

TABLE I.—*Haematological Averages of Meat-eaters and Vegetarians*

	Meat-eaters (40)			Vegetarians (42)		
	Range	Mean	S.D.	Range	Mean	S.D.
Red cells (millions/c.mm.)	4·46–6·85	5·55	0·58	1·9–6·6	4·67	0·9
Haemoglobin (g./100 ml.)	11·1–19·6	15·44	1·4	7–17	14·32	1·71
M.C.H.C. % ..	21·7–35·5	28·25	2·32	23·6–33·7	28·54	1·71
M.C.V. (c.μ) ..	80–114	96·33	8	80–153	109·48	13·4
E.S.R. (Wintrobe) ..	1–20	4·43	4·24	1–37	10·64	9·15
Total W.B.C.* ..	3,000–9,000	6,022	1,843	3,000–9,000	5,600	1,524·2
Neutrophils % ..	30–72	60·4	10·38	39–74	58·25	9·38
Lymphocytes % ..	20–62	31·7	10·52	15–55	35·68	10·34
Mononuclears %	1–8	4·64	1·76	1–9	3·86	2·35
Eosinophils % ..	0–8	2·64	1·76	0–12	2·04	2·59
Basophils % ..	0–4	0·54	0·91	0–1	0·25	0·44

* For the leucocyte count only 33 meat-eaters and 28 vegetarians were observed.

The range and the distribution around the average mean (the standard deviation), especially of red cell counts, were quite abnormal among vegetarians. Whereas there was only one instance among meat-eaters of a red cell count below 4,500,000, there were seventeen among vegetarians. Eight of the latter had red cell counts of 4,000,000 and below, two showing marked anaemia with red counts of under 2 and under 3 millions per c.mm.; all the eight had an M.C.V. above 110 c.μ. Though the average haemoglobin value for meat-eaters was significantly higher than for vegetarians, the difference was not so marked as with the red cell counts. (The explanation of this selective effect on red cell levels in vegetarians lies in the macrocytic type of blood picture exhibited. In haemopoietic-principle (or principles) deficiency anaemia the red cells suffer more than haemoglobin, but in iron-deficiency anaemia it is the haemoglobin which drops relatively more than red cells.) There were five vegetarians and one meat-eater with a haemoglobin value of less than 13 g. Average mean corpuscular haemoglobin concentration (M.C.H.C.) values were low in both groups, being less than one-third in 29%, but there was no significant difference between the two

groups. The M.C.V. in the vegetarians was significantly higher than in the meat-eaters—109.48 c.μ (S.D. 13.4) and 96.33 c.μ (S.D. 8). Twenty vegetarians and one meat-eater had an M.C.V. higher than 110 c.μ, and all except four vegetarians had red cell counts lower than 4,500,000.

The erythrocyte sedimentation rate was found to be significantly higher among the vegetarians. Average means were 10.64 mm. (S.D. 9.15) and 4.43 mm. (S.D. 4.24). Correction for anaemia (Hynes and Whitby, 1938) made no appreciable difference, the corrected average for vegetarians being 9.4 mm. In unit B also the E.S.R. in vegetarians was very significantly higher than in meat-eaters—14.83 mm. (S.D. 9.31) and 4.14 mm. (S.D. 2.54)—in spite of the small total number examined and lack of significant difference between the Hb and red cell levels of the groups. Leucocytes of the two groups of unit S showed no significant differences (Table I).

To sum up, the vegetarians showed a widespread low-grade macrocytic anaemia. In comparison with meat-eaters they had significantly lower haemoglobin and red cell levels, but the M.C.V. and E.S.R. were significantly higher.

Sternal Marrow

The averages, the standard deviations, and the range for each type of cell have been recorded for vegetarians and meat-eaters separately (see Table II). The main point

TABLE II.—*Sternal-marrow Differential Nucleated Cell Count*

	Vegetarians (41)			Meat-eaters (40)		
	Range	Mean	S.D.	Range	Mean	S.D.
Nucleated red cells:						
Megaloblasts	0–18·5	2·76	2·91	0–2	0·69	0·59
Erythroblasts	2·25–20	10·01	4·64	0·5–8·25	2·13	1·44
Macroblasts	1·75–24·5	12·51	4·52	3–18·5	8·78	3·4
Normoblasts	0–15·5	6·04	3·92	3–27·75	14·52	6·01
White cell series:						
Myeloblasts	0·25–5·25	2·18	1·26	0·1–5·25	2·22	2·99
A. Granular series:						
Premyelocytes	0–6·5	1·6	1·4	0–5·75	1·51	1·32
Neutrophil myelocytes	3·25–17	9·81	3·53	2·5–5·25	9·85	4·14
,, metamyelocytes	7·75–22	14·02	3·57	4·75–19·75	13·38	3·56
,, band form	1·25–10·75	5·43	2·32	1·75–11	5·61	2·29
,, segmented	8·25–48·75	14·44	7·14	2·8–39	15·62	7·89
Eosinophil myelocyte	0–7·5	2·31	4·11	0·5–5·75	1·75	1·26
,, metamyelocyte	0–3·5	0·93	0·77	0–2·25	0·72	0·6
,, band form	0–1·75	0·25	0·46	0–1·5	0·2	0·33
,, segmented	0–10·25	2·26	2·05	0·25–7·25	1·73	1·37
Basophils	0–2·25	0·56	0·6	0–2	0·6	0·56
B. Non-granular series:						
Lymphocytes	4·5–23·5	13·61	4·65	7·5–33	18	7·46
Plasma cells	0–2·25	0·72	0·61	0–2·5	1·15	0·65
Large mononuclears	0–2·25	0·4	0·56	0–2·25	0·52	0·6

of interest was the difference between the two groups in respect of the nucleated red cell elements. The percentage of megaloblasts, erythroblasts, and macroblasts in the vegetarians was significantly higher than in the meat-eaters. In contrast the percentage of normoblasts was significantly lower among vegetarians than among meat-eaters. Even excluding the marrow counts of the two markedly anaemic vegetarians (see above) the significant differences held true. There were six vegetarians with megaloblasts above 4%; but only one of the meat-eaters reached 2%. Again, 27 vegetarians and one meat-eater showed a proportion of erythroblasts higher than 8%. Readings of more than 4% of megaloblasts and 8% of erythroblasts in sternal marrow are well outside the usually accepted normal limits.

It was found that in the meat-eaters no significant correlation existed between the red cell count, Hb, M.C.V., and the nucleated red cell elements of the sternal marrow. But in the vegetarians the haemoglobin and the red cell counts bore a significant negative correlation to the percentage of megaloblasts. The correlation between red cell counts and macroblasts, also normoblasts, was positive but significant at 5% value. The M.C.V. showed a positive correlation to the percentage of megaloblasts, significant at 5% value.

Clinical

There was no clear clinical difference between the two groups. No one had an enlarged spleen. The vegetarians could often be distinguished by a tired look. The average means of weight and height showed no appreciable difference. The history of past illnesses was carefully gone into in each case (Table III). Authentic records of previous treatment in hospital overseas were available, and the men were under the regular supervision of the unit medical officer. Only five meat-eaters and six vegetarians gave a history of a relevant illness during the previous year. Three of these six vegetarians (two had had bacillary dysentery and one malaria during the previous year) and another harbouring hookworms showed red cell counts below 4,000,000 per c.mm. and macrocytosis (M.C.V. above 110 c.μ). Four vegetarians and six meat-eaters showed hookworm infestation. This was light, was equally distributed between the two groups, and bore no relation to the blood levels (Table III). Thus out of ten vegetarians with a possible anaemia-precipitating factor four showed macrocytic anaemia. None of the thirteen meat-eaters exhibiting similar precipitating factors (Table III) was suffering from appreciable anaemia, the lowest red cell count and Hb reading being 4,750,000 and 13.18 g.; there was no macrocytosis.

TABLE III.—*Complicating Factors*

Disease	No. of Cases	
	Vegetarians	Meat-eaters
*Bacillary dysentery	3	1
Hookworm	4	6
*Infective hepatitis	Nil	1
*Malaria	2	Nil
Roundworm	Nil	1
Syphilis (under treatment)	1	3
Tapeworm	Nil	1

* During the previous year.

Signs suggestive of early hypovitaminosis A and B_2 (riboflavin and nicotinic acid) were seen in a number of cases in both groups (Table IV); the incidence did not vary significantly between the meat-eaters and the vegetarians. Koilonychia and flattened nails were seen. These findings in skin, mouth, eyes, and nails were not confined to this one unit but were to be seen well distributed among the local Indian soldier population.

TABLE IV.—*Findings in Mouth, Eyes, Nails, and Skin*

	Meat-eaters (40)	Vegetarians (42)
Angular stomatitis	32	15
Cheilosis	22	24
Seborrhoea of nose	9	4
Geographical tongue	1	—
Glossitis	1	1
Bitot's spots (xerophthalmia)	5	3
Phrynodermia	—	2
Koilonychia	1	3
Flat nails	1	4

Discussion

The vegetarians on the whole showed significant incipient macrocytic anaemia which on quite a few occasions was marked and clinically overt even though the men were performing full duties. Their sternal-marrow picture was also significantly different from that of the meat-eaters and confirmed the findings in the peripheral blood. The megaloblasts were seen to be increased with the fall in the red cell count and rise in M.C.V. Normoblasts and macroblasts, on the other hand, increased or decreased with the red cell count. These facts meant that a factor (or factors) contained in the weekly 20-oz. ration of meat and needed for maturation of megaloblasts and prevention of macrocytic anaemia was not always present in the required

amount in the diet of vegetarians. Both groups seemed to be deficient in iron, as indicated by the low M.C.H.C. The finding of koilonychia and flattened nails supported this idea.

Clinically the two dietetic groups presented no differences. Relevant past illnesses and helminthic infection were scarce, but, as has already been emphasized, four of the ten vegetarians with a possible precipitating factor showed appreciable macrocytic anaemia. Of the 32 remaining vegetarians to whom no precipitating factor could be assigned four showed a comparable degree of macrocytic anaemia (red cells below 4,000,000 and M.C.V. above 110 c.μ). This difference in the incidence of anaemia was, however, not significant. Thirteen meat-eaters had similar precipitating factors but, as already stated, none showed anaemia; the higher incidence of anaemia amongst the vegetarians with precipitating factors (4 out of 10) was thus significant. In other words, there was strong evidence to show that under the particular conditions of diet, work, and coincident illness 20 oz. of fresh mutton a week was sufficient to prevent the development of macrocytic anaemia.

The incipient macrocytic anaemia among the vegetarians doing full duties and the high yearly admission rate to hospital (54.1 per 1,000) of vegetarians with nutritional macrocytic anaemia, often severe and serious, could be linked. Any factor putting the bone marrow of such "normal" men to a haemopoietic stress can be understood to bring out a complete picture of haemopoietic failure and gross anaemia of the macrocytic type. That this did happen is borne out by the significantly higher incidence of precipitating factors among vegetarian anaemia patients as compared with men at work. All except one of the vegetarian anaemia cases in hospital had one or more of such factors operating. On the other hand, there were only ten instances (out of 42) of this happening in the vegetarians at work. Malaria, bacillary dysentery, and hookworms were the three commonest precipitating factors in the anaemia series.

Three of the vegetarians showing moderate to severe macrocytic anaemia were admitted to hospital for fuller investigation, including repeated stool examinations, Kahn test, gastric analysis, and skiagram of chest. In one case there was a history of an attack of bacillary dysentery six months previously, but nothing abnormal was observed at the time of the present investigation. The other two had had no illness for at least the previous eighteen months, and thorough clinical and laboratory investigation in hospital revealed no other abnormal findings. Rest in bed and the unit diet led in both cases to return of a normal blood picture within four weeks (Table V).

TABLE V.—*Result of Treatment of Two Cases of Anaemia Among the Vegetarians*

Case No.	Time	R.B.C. (millions)	Hb (g.)	M.C.H.C. %	M.C.V. c.μ
1	On admission	2·7	11·64	28·1	153·4
	4 weeks after unit diet and bed rest	4·8	14	31·1	93·7
2	On admission	3·7	14·7	30·6	128·6
	4 weeks after unit diet and bed rest	5	14·7	32·6	90

At the time of the investigation it was questioned whether diet alone without precipitating factors was capable of producing a nutritional macrocytic anaemia. According to Thomson (1944), "It is doubtful if this nutritional macrocytic anaemia has ever been described in cases without some unusual strain on haemopoiesis, such as that of pregnancy or malaria." There appears to be little doubt that this does happen under certain conditions of hard physical work even when the total daily calorie intake is over 3,000 and vegetable protein over 80 g. The part played by work on a borderline diet is easily understood, and was well illustrated by the brisk haematological recovery of the two anaemia cases on being put to bed on the very diet which had produced their anaemia. Several workers have recently recorded cases of nutritional macrocytic anaemia due to diet alone and without precipitating factors (Moore *et al.*, 1944; Watson and Castle, 1946; Spies *et al.*, 1948).

Summary

Haematological investigation of a group of vegetarian and meat-eating Indian soldiers doing full duties in a desert garrison of about 17,000 meat-eaters and 1,188 vegetarians, the latter of whom showed a high hospital admission rate of nutritional macrocytic anaemia, revealed that on the average the vegetarians exhibited a statistically significant lower blood level, with macrocytosis. A number were suffering from frank nutritional macrocytic anaemia. The vegetarians' sternal-marrow nucleated red cell percentages were also significantly different from those of the meat-eaters and had a higher megaloblast–erythroblast level.

In the absence of any constant aetiological factor other than diet the haematological differences were concluded to be due to the lack of the weekly ration of 20 oz. of fresh mutton in the vegetarians' diet and the consequent insufficiency of haemopoietic requirements. The raily rations contained over 3,000 calories and over 80 g. of vegetable protein.

It was shown that under conditions of hard physical work diet alone, unassisted by precipitating coincident diseases, could bring about a frank nutritional macrocytic anaemia.

There was suggestive evidence of widespread iron deficiency in both groups.

We wish to thank Professor Chandrasekhar, of the All India Institute of Hygiene and Public Health, Calcutta, for the statistical calculations, and the D.M.S. in India for permission to publish this paper.

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TOTAL CYSTECTOMY

BY

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Malignant disease of the urinary bladder is fairly common and if untreated usually causes great suffering, especially in its later stages. Cystectomy itself is not a difficult operation, but the diversion of the urinary flow which it necessitates is not so simple. A cystitis is often present quite early in malignancy; this responds poorly to the usual forms of treatment, and in elderly people soon leads to an ascending infection with dilatation of the ureters and renal insufficiency. In such cases transplantation of the ureters into the colon becomes a very hazardous procedure, and the general surgeon has been loath to undertake it. The choice of technique, too, has been a difficulty. The simple ones have not been satisfactory, and the more elaborate seemed suitable only for the specialist. This at any rate has been my own experience.

Some years ago, however, a method was introduced of implanting the ureters into the colonic wall, without

interrupting their continuity with the bladder, as a first stage. After the lapse of about three weeks the ureters are divided a short distance below the site of the implant and the upper end is tucked into the colon through a small incision in its wall. The object is to allow the ureter to get over the stage of oedema and constriction due to its inclusion in the wall of the bowel and also to obtain a new blood supply from adhesions before it is subjected to the risk of infection from faecal contamination.

The method seemed so sound and reasonable that I decided to try it. My first case was in 1946, and I have now done six cases in all, with no operative mortality. The number of cases is of course very small, but they are all that I have seen in the interval, and I believe the operation can be performed with a good chance of success by any general surgeon.

The Operation

It may not be out of place to give a description of the operation. I have used a right paramedian incision extending a little above the umbilicus. The bladder is first examined and the question of operability decided; then the left ureter is found on the posterior abdominal wall and isolated for a few inches. A convenient part of the lower colon is chosen and an incision made through the peritoneal and muscle coats down to the mucous membrane.

The size of the ureter varies considerably in these cases, but usually an incision about 1½ in. (3.75 cm.) in length and slight separation of the divided muscle coats are sufficient to make a comfortable bed for it. It is very important that the area should be properly peritonized. A similar procedure is then carried out on the right side and the abdomen closed.

There may be anuria or a very diminished quantity of urine for 48 hours following the operation, but after that the flow is normal. In most cases the patient will have been on urinary antiseptics before operation, and these should be continued when the flow is restored.

In all my cases there has been considerable trouble after this stage from abdominal distension and tympanites, which may last up to a week or ten days before the bowel regains normal function. A most important benefit of the operation is that this phase is passed before the ureter is opened into the bowel.

The second stage is best done three weeks later, and for the last of these weeks the patient is given a course of sulphasuxidine or some similar drug. At the second operation the abdomen is opened through the same incision, which is now carried down to the pubes.

Again I am accustomed to do the left side first. The peritoneum is divided over the ureter so as to expose it just below the implant and is cleanly divided about ½ in. (1.25 cm.) below this. A small incision is made into the lumen of the colon as close as possible below the implant and the upper divided end of the ureter passed into the bowel, which is then sutured round it. A little sulphanilamide powder is rubbed into the area and the peritoneum is closed over it. The right side is treated in a similar fashion.

If the bladder is considered to be removable the cystectomy is then carried out. This is largely extraperitoneal, although it is usually better to include the peritoneum over the site of the tumour. The pelvic peritoneum is reconstituted and the space below drained through a separate suprapubic stab wound. The abdominal incision is then closed. There is remarkably little upset following this stage, considerably less than after the first one. Although there is some discomfort from the urinary incontinence, this seldom lasts more than a few days.

Case Histories

Case 1.—A man aged 38 had papilloma of the bladder treated by diathermy in 1942. Cystoscopy was done at intervals, and the bladder was clear until 1944, when he was found to have multiple papillomata. He continued to have attacks of haematuria until 1946, when I first heard of the present operation. On July 17, 1946, the first stage—implantation of ureters—was performed. The second stage, including cystectomy, was carried out on Aug. 14. Although the bladder was an almost solid mass of papillomata the pathological report was: "Histological appearances are still those of an active papilloma and not of outspoken carcinoma." When last seen, in April, 1948, he complained of some pain in the left renal area. The blood urea was normal, and nothing was found except tenderness in the left loin posteriorly.

Case 2.—A man aged 48 had had haematuria for two months. On Oct. 30, 1946, cystoscopy showed carcinoma above the right ureter. The first-stage operation was done on Nov. 4. A mass on the right side of the bladder was fixed to the pelvic wall—doubtful operability. On Nov. 25 the second stage, including cystectomy, was carried out. The growth was adherent to the pelvic bone and had to be scraped off it. The pathological report was: "Anaplastic carcinoma, mainly of squamous type, infiltrating the muscle." This man did very well so far as the transplantation was concerned, but two months after the operation he complained of severe pain in the right hip. A radiograph taken on March 2, 1947, showed destruction of the right acetabulum and internal dislocation of the femur. He died a few weeks later from local recurrence of growth. There were no renal symptoms.

Case 3.—A man aged 60 had had haematuria, dysuria, and frequency for two weeks. Cystoscopy showed carcinoma of the bladder—several tumours. At the first-stage operation on Feb. 5, 1947, the bladder was considered removable. The second stage and cystectomy were carried out on March 1. The pathological report was: "Anaplastic squamous carcinoma involving the muscle of the bladder. The three apparently separate masses have the same structure." He remained quite well for 14 months after the operation and then developed spinal secondaries. He had no renal trouble up to the time of his death.

Case 4.—A man aged 45 had had attacks of dysuria and frequency for three years. On Dec. 12, 1945, cystoscopy showed a good deal of cystitis, a neoplasm to the left of the trigone, and what I thought looked like tubercles scattered over the bladder. Although I was not aware of it at the time, these were really the vesicles of cystitis cystica. He had been in a sanatorium for some months after a spontaneous pneumothorax in 1933. No tubercle bacilli were found in the urine and the pyelogram was normal except for some dilatation of the ureters. At the first-stage operation on Jan. 13, 1947, there was thickening of the bladder wall over the site of the tumour, but operation was considered to be possible. The second stage and cystectomy were carried out on Feb. 2. The pathological report was: "This bladder exhibits cystitis cystica and also carcinoma." In this case, as in the previous one, there were multiple growths. When seen in November, 1948, he was perfectly well and free from symptoms.

Case 5.—A woman aged 63 had a recent history of haematuria and dysuria. On April 25, 1947, cystoscopy showed a large papilloma of the bladder at the right base and several seedling growths round it. A fragment of the growth was sectioned by diathermy, and the report stated: "Fragments suggest papilloma. I see no histological proof of malignancy." There was a good deal of reaction after the diathermy, and when cystoscopy was carried out on May 12 I decided to leave her for another month. At that time I was very suspicious of malignancy, and a further portion, removed by diathermy, was sent for section. The pathological report stated: "The appearances are deemed consistent with a malignant papilloma." At the first-stage operation on Aug. 11, 1947, the bladder seemed quite operable. The second stage and cystectomy were done on Sept. 1. The pathological report was: "The tumour is a well-differentiated transitional-cell carcinoma. The adjacent mucosa shows an active chronic cystitis with early changes of cystitis cystica." In November, 1948, her doctor reported that she was very well and had no complaints.

Case 6.—A woman aged 56 was seen on March 4, 1948. She had a history of carcinoma of the cervix treated with radium three years before. For the past year she had had severe intractable cystitis with haematuria at times. When cystoscoped as an out-patient there was so much pus that the bladder wall could not be seen. She was admitted to hospital, and after a week's treatment was cystoscoped again. There was a large ulcer of the bladder base, which appeared malignant. As her general condition was good and she was getting so much trouble from the cystitis I decided to do an exploratory operation and see if there was any chance of a radical removal. At the first-stage operation on May 18, 1948, a dense mass of scar tissue was seen round the cervix, including both ovaries, and adherent to the rectum behind and the bladder base in front. At the second stage, on June 8, cystectomy and hysterectomy were performed. The operation was very difficult; the only pleasant feature was not having to worry about the lower ureters in doing the complete hysterectomy. Repair of the lower peritoneum was also difficult after such a wide excision, and was no doubt responsible for the unusual degree of abdominal discomfort and distension which the patient had after the second stage. The pathological report stated: "Cervix: large white mass in cervical wall consists of dense and partially hyalinized fibrous tissue. Both ovaries replaced by a compact mass of dense fibrous tissue. Bladder: the transitional epithelium is somewhat heaped up in places but there is no evidence of invasion. The subepithelial tissue is oedematous and there is a considerable amount of round-celled infiltration of the plasma-cell type, the result of chronic irritation." Although no malignant cells were found I think this was at least a precancerous condition. In November, 1948, she was quite well except for attacks of very severe constipation.

Summary

Six cases with malignant or pre-malignant conditions of the bladder are described. In all the cases transplantation of the ureters was carried out by the method of implanting the ureters in continuity, as a first stage, followed by cystectomy. There was no operative mortality.

Medical Memoranda

Cancrum Oris Among African Natives

The classical description of cancrum oris as given by Christian (1938) is that of a rapidly progressive gangrenous stomatitis in a child already debilitated by another disease, usually one of the exanthemata. Varying treatments are advised, but the prognosis is regarded as hopeless, though Thomson and Findlay (1933) state that occasional recovery does take place. Tidy (1939) states that death is almost invariable. All authorities seem agreed that the probable cause is a combination of organisms similar to that found in Vincent's angina—i.e., spirochaetes and fusiform bacilli. The fact is stressed by all writers that cancrum oris is essentially a rare disease, though I have been unable to find any actual incidence figures.

Observations in Africa.—During the years spent as student, house-surgeon, and general practitioner I did not encounter a single case of cancrum oris in Britain, despite the fact that the whole of this period was spent in a highly industrialized area where the children were often poorly nourished and often lived in unhygienic conditions. In contrast, in less than three years in the Serenje district of North Rhodesia we have come across no fewer than five cases. In the years 1945–7 cancrum oris patients constituted 0.7% of admissions. In no case has there been a previous history of a specific illness. It would seem, therefore, that the main aetiological factors responsible for this comparatively high incidence are the bad diet of the African native and his unhygienic mode of life. It is also worthy of note that the probable causal organisms of cancrum oris are similar to those which are almost invariably found in tropical ulcer, a disease that is always present among the people of this district. Of the five cases seen three were fatal. Of the two who recovered one was treated by extensive resection of the gangrenous area, followed by plastic repair; the other was treated with penicillin, and this case is detailed below. In no instance did the clinical appearance or progress of the disease differ from the usual description.

Penicillin Therapy.—As favourable results were obtained by penicillin therapy in cases of Vincent's angina it seemed natural to hope that similar results might follow the use of penicillin in cases of cancrum oris. The rarity of the disease, however, seems to have made it difficult to procure reliable information. Fish (1946) was unable to quote any cases. However, a very detailed case history has since been published by Shrand (1947). The case history below is published in the hope that it may add to the volume of information regarding the treatment of one of the most terrible of all children's diseases. It is regretted that circumstances made it impossible to produce more than a purely clinical case history.

Case History

A female MuLala child aged about 2 years was admitted to Chitambo Hospital from an outlying dispensary on Oct. 3, 1947. On clinical examination a typical early cancrum oris was seen. The angle of the lip was ulcerated and further investigation showed the ulcer extending back on to the gum in the right canine fossa. There was a well-marked area of brawny induration of the right cheek, extending back to the anterior border of the masseter muscle. Temperature 100.4° F. (38° C.). No history of previous illness could be elicited from the parents.

The following day a brother of the above, a male MuLala child of about 4 years, was admitted with a very advanced cancrum oris. The lips, nose, and most of the right cheek had disappeared and been replaced by a single large sloughing ulcer. Temperature 98.4° F. (36.9° C.). This patient was obviously moribund, and died within twenty-four hours of admission. The virulence of the disease process may be judged from the statement of the parents that the first sign of disease in the boy had occurred only five days previously and in the girl three days previously.

In the case of the female child palliative treatment was adopted. The ulcer was swabbed four-hourly with a strong solution of potassium permanganate, and an attempt was made to maintain the child's resistance by feeding it on thin gruel. Despite these measures the ulceration continued to progress. On Oct. 10 a supply of penicillin became available and treatment with it was instituted, 10,000 units in aqueous solution being administered intramuscularly every three hours. The swabbing with potassium permanganate was continued. After the third injection treatment was interrupted for twelve hours owing to objection from the parents for superstitious reasons. Injections were then resumed, and were continued until 500,000 units had been given.

Results were apparent after twenty-four hours. The brawny induration of the cheek began to soften and the line of demarcation became much less apparent to palpation. After thirty-six hours the sloughs of the ulcerated area began to separate, leaving a granulating surface. After three days of treatment all signs of infiltration of the surrounding tissues had vanished and the ulcer presented a clean and obviously healing surface. Recovery was uninterrupted, and the child was discharged on Oct. 27.

Comment

The above case history is interesting in that it records two cases in one family at the same time. There may have been a common source of infection, but it is more probable that the male child, with a highly virulent disease, infected the other. This may indicate a degree of infectivity that does not seem to have been stressed in the literature. This case also indicates that cancrum oris should join the group of conditions classed as highly responsive to penicillin therapy. It was astonishing to see a condition so notoriously fatal, and which had already killed one member of the family, respond so rapidly to penicillin, supported only by the simplest of local measures.

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On St. Thomas's Day, Dec. 21, Major-General R. J. Blackham, A.M.S.(ret.), and Dr. Arthur Westerman were re-elected members of the Court of Common Council, Corporation of London. General Blackham was for many years the only representative of the medical profession on the Common Council until 1941, when he was joined by Dr. Westerman, the medical officer of the Charterhouse.

Reviews

MEDICAL EMERGENCIES

Emergencies in Medical Practice. Edited by C. Allan Birch, M.D., F.R.C.P. Compiled by 18 Contributors. (Pp. 468; 113 illustrations, 8 in full colour. 25s.) Edinburgh: E. and S. Livingstone. 1948.

What constitutes an emergency is, as Dr. Birch says in his preface, a matter of opinion, and the word has received an unusually liberal interpretation in this book. It might be contended, for instance, that polycythaemia and amenorrhoea could seldom merit this description, and many of the most useful sections of this work are open to the same ungenerous criticism.

Dr. Birch has recruited eighteen contributors who have together compressed much recondite information into a small compass. Among the more conventional sections, the editor's own description of the management of abdominal catastrophes and Dr. Avery Jones's account of gastro-duodenal haemorrhage are noteworthy. Dr. Rae Gilchrist contributes an excellent discussion of cardiovascular emergencies—perhaps the most commonly encountered in practice. Dr. Murgatroyd's section on emergencies in tropical medicine is particularly useful, for these are often fulminating and often unfamiliar to the practitioner in temperate climes. Descriptions of medical emergencies at sea and in the air are welcome additions to a book of this kind; there are directions for emergency baptism, for broadcasting for relatives of the dangerously ill, and for obtaining supplies of antivenene. The final chapter gives an account of the common practical procedures, the reader having been instructed in an earlier one in the treatment of mishaps resulting from them. In short, there are to be found here answers to the many problems which arise suddenly and unexpectedly in the daily practice of medicine, and only a commendable modesty can have prohibited Dr. Cheetham from including this work itself in his list in Chapter I of the essential contents of the practitioner's emergency bag. The book is excellently produced, and by present-day standards is cheap at the price of 25s.

R. BODLEY SCOTT.

TEXTBOOK OF ENDOCRINOLOGY

Lehrbuch der Inneren Sekretion. By F. Verzár. (Pp. 610; 80 illustrations. 52 Swiss francs.) Liestal, Switzerland: Verlag Ars Medici Lüdin A.G. 1948.

Most recent books on endocrinology have come from America and have inevitably reflected the enormous amount of work on hormones which has been carried out in the U.S.A. during the past twenty years or so. Professor Verzár's new textbook of endocrinology brings, for a change, a Continental point of view. His position in Switzerland has allowed him to select and bring to our notice work which is apt to be missed in Britain, particularly work that was published during the war.

Professor Verzár has chosen the usual method of treating each gland individually, and in separate chapters he describes the general anatomy and histology of the gland, the results of its removal, the methods of isolating its hormones, and their chemistry. He then discusses how the production of the hormone is regulated and the interrelations with the other glands. He describes in some detail the methods of bio-assay. Finally he considers clinical conditions of over- and under-function. Throughout he emphasizes the biochemical rather than the morphological aspect of the subject.

In the introduction he explains that he has tried to select what appear to be the most important findings up to 1945–6 rather than to confuse the reader with a maze of contradictory reports of varying significance. The attempt is successful, and any alterations in emphasis that might be suggested now are an indication only of the speed with which new information on the subject is becoming available. He gives prominence to Mansfeld's claims to have isolated thyroid hormones which stimulate red blood cell formation and which oppose the action of thyroxine, and describes Bomskov's much disputed work on the thymus in a chapter on this gland which, while longer than usual, is certainly justified.

Professor Verzár is widely known for his work on the relation of the adrenal cortex to phosphorylation processes. In his review of the function of the cortex he favours the belief that there are not separate types of cortical hormone independently controlling water and electrolyte metabolism or carbohydrate metabolism, but that all cortical functions can be carried out by one hormone. Taken as a whole, the book is an excellent summary of the general position in endocrinology. The chapters on the endocrine functions of the gonads are, however, rather unsatisfactory and incomplete, partly perhaps because the author has deliberately omitted any discussion of the gynaecological aspects. It is unfortunate, too, that the illustrations in an otherwise well-produced book should be so few and of rather poor quality.

P. L. KROHN.

EXAMINING THE LUNGS

Procedure in Examination of the Lungs, with Especial Reference to the Diagnosis of Tuberculosis. By Arthur F. Kraetzer, M.D. Third edition, revised and with a preface by Jacob Segal, M.D., F.A.C.P., F.C.C.P. Oxford Medical Publications. (Pp. 150; illustrated. 18s.) New York and London: Oxford University Press. 1947.

The intention of this book is to provide for the student a detailed account of physical examination of the lungs "with especial reference to the diagnosis of tuberculosis." After an adequate account of the techniques of inspection, palpation, percussion, and auscultation and of the findings in the normal chest, the author discusses the interpretation of abnormal findings. Each individual variation from normal, such for instance as diminished breath sounds or rales, is tabulated in relation to other symptoms and signs in an attempt to provide a sort of key by reference to which the diagnosis may be reached. In so far as this provides a reasonable scheme for the interpretation of unequivocal signs it may perhaps be useful, even though its validity as an indication of the actual mode of thought of the experienced physician may well be doubted. It is in the emphasis which is placed throughout the book on physical examination as a means of early diagnosis of pulmonary tuberculosis that a curiously old-fashioned and unrealistic impression is given.

Experienced physicians have recognized for many years that minimal tuberculous lesions of the lung often give rise to no physical signs by which their presence can be detected and that radiography is the surest means of detecting them. This truth forms the basis of all modern schemes of tuberculosis case-finding; but the unfortunate medical student who took this book as his guide would obtain the impression that unless he could diagnose by physical signs the presence of small tuberculous lesions in the lungs his technique, his mental processes, or both would be at fault. The author's attitude towards radiology may be exemplified by two excerpts. On p. 83 he recounts a case of non-tuberculous pneumonia erroneously diagnosed at first as tuberculous, the error eventually being shown by the unexpected clearing of radiographic shadows. In commenting on this he remarks, "The patient should never have been sent for *x*-ray examination, with its attendant exposure and risk of spreading the disease." On p. 106 he states that pleural and pulmonary rales may be distinguished "by the history, by the symptoms, by the presence or absence of clubbing of the fingers, by the patient's general health, and alas! [*sic*] by the *x* ray."

The literary style is presumably intended to be stimulating and to hold the interest of the student, but to the reviewer it seemed a curious mixture of pretentious verbosity with, in places, an almost distressing jocularity. The barbarous solecism (which is unfortunately becoming more and more frequent) of using the word "pathology" as synonymous with "disease" or "lesion" recurs—e.g. (p. 47), "Normal breath-sounds do not rule out pathology by any means."

That physical signs play an essential part in the diagnosis of pulmonary disease, and that the instruction of students in the methods of eliciting them and in their interpretation is of great importance, no one will wish to deny. Physical and radiographic examinations are complementary, each having its proper sphere. Most physicians would agree that there is a grave danger that the manifest superiority of radiography over physical examination in the diagnosis of minimal tuberculous lesions may lead to the neglect of physical examination in its proper sphere. It is to be expected, however, that an attempt to stimulate the student's interest in physical examination of the chest by refusing to

acknowledge its limitations, as in this book, will defeat its own object. There was a well-known domestic cleansing preparation which advertised itself by announcing that it would not wash clothes. The student's interest in the art of eliciting and interpreting physical signs in the chest might well be stimulated rather similarly by the unequivocal statement that physical signs will not enable a diagnosis of early pulmonary tuberculosis to be made, but have a very great value in many other maladies, including some in which they give information which no other method can give.

The book is a reprint, with limited revision and the addition of a short appendix, of one published first in 1930. Its account of the actual technique of examination of the chest and its instructions to the student on the method of acquiring facility in it are sound and helpful; but even at the date of its first publication it probably presented an unbalanced view of the proper place of physical examination in the diagnosis of pulmonary tuberculosis. It certainly cannot be recommended now.

J. G. SCADDING.

THE NEGLECTED CHILD AT HOME

The Neglected Child and his Family. A study made in 1946–7 of the Problem of the Child neglected in his own Home, together with certain recommendations made by a Subcommittee of the Women's Group on Public Welfare (in association with the National Council of Social Service). Introduction by J. B. Priestley. (Pp. 140. 5s.) London: Oxford University Press (Geoffrey Cumberlege). 1948.

This report of a subcommittee of the Women's Group on Public Welfare considers the neglected child in his own home—that is, before he comes to the stage covered by the Curtis Report. Mr. J. B. Priestley in his foreword commends it as an admirable study of a complex problem, but he notes that no mention is made of those children who, although surrounded by all the luxuries, are left so emotionally insecure that they grow up to be antisocial and provide a major problem in criminology.

The report points out that definite physical cruelty is diminishing but that neglect is perhaps increasing and is due more to fecklessness than to crime. As has been said, stupidity is the sin that is always punished and never forgiven. This involves not only physical neglect but mental neglect and even cruelty, which is not regarded sufficiently seriously unless the child shows definite signs of specific mental illness—as he does only relatively rarely. The sequence behind the cases studied is most often one of mismanagement—poverty, malnutrition, ill-health, apathy. Obviously prison is no remedy for child neglect, though often demanded by the public, and fines are not much better. Removal of the child from the home is the easiest solution but by no means usually the best. It should be possible to put parents on probation and make them enter into recognizances for good behaviour, but they ought to have the right to legal representation when the case comes before the court. Local authorities should promote all cases in the courts, but they should all establish children's care committees with suitable officers and staff. They should establish boarding accommodation in the form of schools, homes, and hostels for children who must at least temporarily be removed from their families.

All secondary-school girls should be taught child welfare, and home-craft and parent-craft should be disseminated by every means—press, broadcasting, cinema, and home visiting. The general public should be instructed in normal child development. More facilities should be devised for preserving the health of mothers of young children, and there should be an extension of child-guidance and general psychiatric services, including the provision of expert psychiatric advice at maternity and child-welfare centres. Rehabilitation centres affording rest breaks and holiday homes to mothers are desirable, when, if possible, their children can accompany them. The provision of home helps, day nurseries, nursery schools, and even of household equipment should be increased. Family case work and experiments such as the Brentwood Recuperation Centre in Lancashire should be extended.

This is a most informative and valuable report and should be studied by all interested in children.

R. G. GORDON.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

Poetry of a Peripatetic. By Galen. (Pp. 19. 3s.) Romford: Wilson and Whitworth. 1948.

Verses on many topics by a medical man.

Demonstrations of Physical Signs in Clinical Surgery. Part III. By H. Bailey, F.R.C.S., F.A.C.S., F.I.C.S., F.R.S.Ed. 11th ed. (Pp. 304. 8s. 6d.) Bristol: John Wright. 1948.

In this part the author considers the abdomen and the genito-urinary system.

Enuresis or Bed-Wetting. By R. J. Batty, M.D., B.Sc. D.P.H. 2nd ed. (Pp. 103. 9s. 6d.) London: Staples Press. 1948.

The author has incorporated new material in this edition, especially on the psychological aspect.

Notes on Infant Feeding. By G. B. Fleming, B.A., M.D., F.R.C.P., F.R.F.P.S., and S. Graham, M.D., F.R.C.P.Ed., F.R.F.P.S. 3rd ed. (Pp. 66. 3s.) Edinburgh: E. and S. Livingstone. 1948.

An introductory manual intended primarily for medical students.

The Natural Development of the Child. By A. H. Bowley, Ph.D. 3rd ed. (Pp. 190. 8s. 6d.) Edinburgh: E. and S. Livingstone. 1948.

A guide for parents and teachers. The chapter on adolescence has been enlarged in this edition.

Obstetrics and Gynaecology. By B. M. Willmott Dobbie, M.A., M.B., F.R.C.S., D.M.R.E. (Pp. 358. 20s.) London: H. K. Lewis. 1948.

A short practical account intended specially for the novice in general practice.

The Pharmaceutical Pocket Book. Published by the Pharmaceutical Society of Great Britain. 15th ed. (Pp. 427. 12s. 6d.) London: Pharmaceutical Press. 1948.

An introduction to the practice of pharmacy and a reference book for pharmacists.

Zur Theorie des Typhus Abdominalis. By R. Rössle. (Pp. 28. M.2.) Berlin: Akademie. 1948.

The author elaborates his theory of the part played by allergy in typhoid.

Some Victorian Portraits and Others. By Hilda Martindale, C.B.E. (Pp. 106. 10s. 6d.) London: George Allen and Unwin. 1948.

Biographical studies of prominent social workers and reformers, Civil Servants, and others.

Modern Methods of Mental Treatment. By J. W. Fisher, M.R.C.S., L.R.C.P., D.P.H., D.P.M. (Pp. 100. 6s.) London: Staples Press. 1948.

A short guide for nurses.

Mycoses and Practical Mycology. By N. Gohar, M.R.C.S., L.R.C.P. (Pp. 234. 25s.) London: Baillière, Tindall and Cox 1948.

An introductory handbook for prospective dermatologists and students of tropical medicine.

Zur Hygiene der Arbeit. By F. Vering. (Pp. 38. No price.) Vienna: Wilhelm Maudrich. 1948.

An essay on industrial hygiene.

Behold the Axe. By F. Hernaman. (Pp. 288. 9s. 6d.) London: Staples Press. 1948.

A historical novel about an attack of the Crusaders on Constantinople.

Traitement Chirurgical de L'Otospongiose. By M. Sourdille. (Pp. 253. 750 francs.) Paris: Masson. 1948.

A detailed illustrated manual for surgeons.

The Search for Health. By D. Stark Murray, B.Sc., M.B., Ch.B. (Pp. 158. 2s. 6d.) London: Watts. 1948.

An exposition for the layman of the causes and treatment of disease.

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CO-ORDINATION OF THE TUBERCULOSIS SERVICES

The continuous fall in tuberculosis mortality in England and Wales, broken only by the war periods, gives grounds for reasonable hope that the disease can be reduced to insignificance. The causes of this decline are complex and obscure, but all will agree with Dr. C. O. Stallybrass, whose survey of the present position appears as the opening paper in this issue, that the most important is improvement in living conditions, and that this socio-economic factor has been assisted by modern methods of treatment and by the segregation of infectious cases in sanatoria made possible by the National Health Insurance Act of 1911. Knowledge of the pathogenesis of tuberculosis has advanced, and there are now grounds for believing that vaccination with a controlled dose of live tubercle bacilli of attenuated virulence, B.C.G., safely establishes a healed primary focus which will confer a considerable degree of protection against subsequent invasion by virulent organisms. At the same time some eminent authorities doubt the strict validity of the evidence, and the problem must still be looked at with scientific caution. There is now a better understanding of the part played by nutrition and environment in maintaining native and acquired resistance to the disease, and the influence of heredity and race is being reviewed in the light of recent research. Advances in radiology have made it easier to discover early pulmonary lesions, so that it is not uncommon to find a small focus of active disease in an apparently healthy person. In treatment a new era is dawning with the use of antibiotics and chemotherapeutic agents which, as further investigations are made, will change the approach to the problem of controlling the lesion.

Yet in spite of these encouraging signs, which should be more than enough to support an optimistic attitude, there is a feeling among tuberculosis workers that all is not well. In a recent letter to this *Journal* (Dec. 25, 1948, p. 1118) Dr. Lissant Cox has picturesquely described the uneasy path that lies ahead through difficulties which he considers mainly due to the break-up of the old administrative machine—a machine which, in general, worked well and produced results. There is little doubt that he is right when he says that at present the chief danger lies in forgetting the essential unity of prevention, treatment, and care work and in failing to view the patient in the setting of his family and his home environment. The treatment of those suffering from tuberculosis must of course be one of the main concerns of tuberculosis workers; but the protection of the healthy is of equal importance, and much time and energy have to be put into preventive work if it is to be effective. Nobody can read Dr. Stallybrass's survey without being impressed by the urgent importance of preventing the spread of infection, particularly among young children; the incidence of tuberculous meningitis in infants is a sensitive index of the amount of infection in any community. The systematic search for the infectious case must never be relaxed, however strongly the limelight plays on new methods of treatment. It is therefore somewhat disconcerting to learn that Dr. A. S. Hall (Jan. 8, p. 71) considers there is a danger of tuberculosis officers being lured from diagnostic and preventive work by the more exciting practice of active treatment.

The reorganization of the tuberculosis services under the National Health Service Act has tended to emphasize the clinical side of the work of the chest clinic to the detriment of its other necessary activities. Infection with tubercle bacilli has not only a profound effect on all body tissues wherever the major lesion may be, but it has such social significance that its successful treatment depends on detailed knowledge of the clinical and family history and of the conditions in which the patient lives and works. An essential aid to treatment is an efficient rehabilitation service to assist the patient to overcome both the disablement and the stigma that are so unfortunately and unnecessarily associated with it. Awareness of the importance of tuberculosis to the public health has now led to the assembly of a formidable array of authorities, officials, clinicians, and auxiliaries, all concerned in its prevention and treatment. Health authorities and care committees, regional boards and management committees, medical officers of health and tuberculosis and health visitors, tuberculosis physicians (in dispensaries, mass radiology units, and sanatoria) and hospital almoners—these are all working towards the one desired end, are all aware of the necessity for helping each other, but are hampered by a certain vagueness in the procedure for co-ordination.

Tuberculosis mortality rates have fallen, but the incidence is still rising; and the number of adult cases on the dispensary registers in 1946 was 50% more than in 1938. No doubt this is partly due to more intensive search for early cases, but the situation does not warrant the transfer of the tuberculosis officer's place of work from the dispensary to the sanatorium, for this would be immediately damaging to public health. The sanatorium treatment of patients is better left to those who have made such work a full-time vocation and have had many years of experience. As Dr. Hall writes, "It is on the field of prevention that the battle against tuberculosis will be won." May it not be that the present dilemma that has prompted the query "Whither Tuberculosis?" has arisen because of neglect of the wise counsel of Sir Robert Philip, who centred the campaign against tuberculosis in the dispensary and made it a unit for combating the disease in all its forms? The present tendency to regard the various manifestations of tuberculosis as separate entities, each the concern of a particular clinical department, will destroy the ability of the tuberculosis service to attack the problem from all sides. Tuberculosis is a specialty that is associated with many branches of medicine and surgery, and if our hopes of eradicating the disease are to be realized it is clear that

one administrative authority must, with the agreement of all concerned, co-ordinate the work of those who are engaged in prevention, diagnosis, treatment, and rehabilitation.

GROUP PSYCHOTHERAPY

A number of articles[1-3] on group therapy during the last few years and, more recently, books[4-6] on this subject have suggested to many medical men that an important new development is taking place in psychological medicine. Certainly group therapy is being increasingly used in psychiatric hospitals and out-patient clinics, and in many of the latter more patients are now being given psychotherapeutic help by this than by individual methods. In a broad sense group therapy may be said to be as old as humanity. Man has always sought the company of his fellows in times of emotional stress, and the commonest way of ensuring that the young person's psychological development will be healthy is to put him into suitable social groups. The term "group therapy," or "group psychotherapy," however, is used for procedures in which help is given to individuals with psychological difficulties through the medium of groups created for this purpose.

Many forces have contributed to this. Most prominent, perhaps, has been the fact that the spread of psychoanalytic thought has created a demand for psychotherapy which has grown out of all proportion to the supply of trained therapists. Practically every trained psychotherapist gets far more requests for his services than he can deal with. The position appears even more disturbing if the psychotherapeutic needs of society are surveyed, for the incidence of neurosis[7] appears to be such that not enough psychotherapists could be trained to give individual treatment to all who require it. A procedure by which several persons can be treated together is therefore of the greatest value. Apart from this external pressure on the psychotherapists there has also been an internal impetus during recent years towards the therapeutic use of groups. This impetus arises as the logical sequence to those advances in the psychology of character and personality whereby, paradoxically, much of the individuality of the person is shown to be derived not so much from such self-contained forces in the form of instincts as from the history of his relations with others. A striking feature of these developments is the way in which the various types of worker—psycho-analysts, psychiatrists, and psychologists—have been moving in the same direction. Among the psycho-analysts this trend may be observed in an ever greater emphasis on the nature of the "here-and-now" feelings in the doctor–patient relationship—the so-called transference situation—with a theoretical counterpart in a turning towards the importance of the earliest relationships between the child and his parents, as contrasted with the former more exclusive reliance on instinct theories. From the other workers the remarkable contributions, both in theory and in practice, of Moreno,[8] Lewin,[9] and Burrow[10] have emphasized the significance for the individual at all times of the forces in his social field. These developments in psychology may well be part of a much deeper *Zeitgeist* in which, according to social philosophers, our Western mass-society is groping towards a replacement of the ideal of the self-sufficient man by one which takes into account man's deep needs "to belong." It is certainly noteworthy that, whatever the contributing forces, in almost every civilized country during the last few decades more and more emphasis is being placed on the contention that man is a social being and that his individuality as a person is meaningful only in terms of his relations with others. There is a risk that this tendency may be carried too far and that the pressure of the group may hinder the exceptional man from expressing himself in art, philosophy, and science: it is to the exceptional man that civilization owes its highest achievements, men who usually stand aside from what Ibsen called "the damned compact majority."

As would be expected from its complex origin, many methods of group treatment have been described. At one end of an imaginary scale could be the mass-suggestion and inspirational approaches exemplified in Couéism and in the Alcoholics Anonymous movement. There might then be a region containing methods with a greater appeal to reason and which accordingly make much more use of explanations of emotional conflicts by the therapist, with or without subsequent free discussion—in which all the unreasonable forces usually involved are apt to play a prominent part. At the other end of the scale would be the methods of what might be termed the sadder and wiser group. This group, following the psycho-analysts, believes that deep emotional conflicts are not resolved unless their unconscious dynamics are revealed in actual human relationships. The work of Bion,[11] Rickman,[12] and Foulkes[6] in this country, and of Slavson and his co-workers[5] in America, illustrates this point of view. Current work in group therapy is mainly concerned with exploring new methods, with the selection of patients, and with the most appropriate compositions of groups. Slavson and his co-workers[5] seem to be in favour of more specific groupings of cases than are British workers, but apart from this it is interesting to note the broad similarity between the group methods founded on psycho-analytic principles yet developed independently in America and in this country. The more analytic the method the more is the group allowed to develop spontaneously. The idea of six to nine adults meeting to take part in a free discussion with the aim of relieving their psychological difficulties may readily recall some religious movements of recent years. The therapeutic group, however, is sharply differentiated from these by the presence of the therapist, whose function from the start is to interpret what is happening. By seeing their unconscious motives in action in the ways they feel towards each other as well as towards the therapist, the group members gradually gain insight into their difficulties and hence freedom from the tyranny of the war within their minds. The demands on the therapist and patients

[1] Wilson, A. T. M., Doyle, M., Kelnar, J., *Lancet*, 1947, **1**, 735.
[2] Jones, S. M., *Brit. J. Med. Psychol.*, 1948, **21**, 104.
[3] Chance, E., *Ment. Hlth, Lond.*, 1948, **8**, 98.
[4] Klapman, J. W., *Group Psychotherapy—Theory and Practice*, 1946. New York.
[5] Slavson, S. R., *The Practice of Group Therapy*, 1947. New York.
[6] Foulkes, S., *Group Analytic Therapy*, 1948. London.
[7] Russell Fraser, "The Incidence of Neurosis Among Factory Workers," Industrial Health Research Board Report, No. 90. 1947. London: H.M.S.O.
[8] *Sociometry*, 1945, **8**, Nos. 3 and 4.
[9] *Human Relations*, 1947, **1**, 1.
[10] *The Social Basis of Consciousness*, 1927. London.
[11] *Human Relations*, 1947, **1**, 314, 415; 1948, **2**, 1.
[12] *Lancet*, 1943, **2**, 678.

also vary with the method. If the unconscious motives are tackled, the primitive nature of many of these motives must sooner or later be brought into the foreground. Great psycho-analytic skill and experience are therefore required to carry the group successfully through the anxieties and other upsets which may follow. More superficial methods are less disturbing to the patient and demand less skill and training from the therapist; but the fact of their being less disturbing may be because the real nature of the patients' problems is avoided.

It is too soon yet to comment on the efficacy of this new work. Evaluation of psychotherapeutic procedures is peculiarly difficult, and it will be some years yet before careful studies can be reported. There would appear to be grounds, however, from the parallelism between the individual and group approaches, to expect results not unlike those which would be obtained by the corresponding methods with individuals. Group therapy is certainly an addition to the resources of psychological medicine, because it saves the time of skilled psychotherapists and because it has already proved to be a most effective instrument in competent hands for resolving psychological conflict. It may also be useful in the treatment of the psychosomatic illnesses. Another point in its favour is that group therapy can help to dispel some of the mysteries of psychotherapy, for the general physician can join in the group and see the psychological specialist at work. This education could have a far-reaching effect. Few people can be members of a therapeutic group conducted on psycho-analytic lines without emerging from the experience much more interested in the need for, and more able to foster, good relations in groups. If hospital physicians join in group therapy there will inevitably be an increased desire to apply this experience in the hospital ward, in the out-patient clinic, and in the hospital as a whole. The great importance of this development, however, may lie outside its immediate therapeutic value. No one can deny the enormous gain in our understanding of the individual which has resulted from the work of the psycho-analysts, and it may be that our understanding of the forces that promote cohesion and disruption in groups—involving problems of great urgency to-day—will be similarly illumined by the psycho-analytic treatment of groups.

CLUBBING OF THE FINGERS

Finding the explanation for clubbing of the fingers is the kind of problem which invites the method of armchair deduction: so many diverse facts known about the conditions in which clubbing appears or disappears must surely make some sort of pattern. The most recent theory comes from Mauer,[1] in Los Angeles, who marshals the evidence for "tissue anoxia" as the cause. He puts forward the interesting suggestion that only with warm extremities—i.e., with a rapid blood flow through the arteriovenous anastomoses of the digits, such as Mendlowitz[2] has shown exists in clubbing—will tissue metabolism be sufficiently high for the fingers to suffer from anoxia. Therefore with diseases like rheumatoid arthritis, Raynaud's syndrome, and Buerger's disease no clubbing is to be expected. The anoxia itself may be the result either of insufficient lung aeration, of shunts as in congenital heart disease, of altitude, or of met- or sulphaemoglobinaemia. To account for tissue anoxia in septic conditions such as subacute bacterial endocarditis or lung abscess Mauer puts forward an earlier suggestion that "corpuscular sludge" formation (due to the same plasma protein change that brings about a high sedimentation rate) itself hinders the giving up of oxygen to the tissues. "Sludge" is the name given to the long rouleaux formations of erythrocytes within the vessels described by Kinsely[3]: these clumped corpuscles have a much smaller surface area from which oxygen diffusion can occur than the unclumped corpuscles. Whether this is important in the fingers depends on the quantitative assessment of diffusion gradient, dissociation rate, temperature, and oxygen consumption. The theory implies that the plasma oxygen tension is diminished. Sludging, however, is usually associated with a slowed blood flow rather than a fast one, and may even usher in irreversible thrombosis—preventable with heparin. Unfortunately for this theory, conditions associated with much rouleaux formation—often with visible sludging—such as myelomatosis, are not associated with clubbing, nor was clubbing observed in most of the recorded cases of congenital methaemoglobinaemia.[4]

It will be interesting to see what this theory will lead to. Like others, it fails to account for clubbing in a number of conditions, such as the unilateral clubbing of subclavian aneurysms, the congenital type of clubbing, and that associated with post-operative myxoedema. A problem such as this is often complicated in the same way as detective stories by false clues, and possibly the congenital and familial types of clubbing described elsewhere in this issue by Dr. W. P. U. Jackson, together with the other interesting cases where no associated condition was discovered, should be regarded in this light. That such cases can occur without apparent serious illness is to be noted, but this does not indicate any less need for full investigation. It would have been interesting to know what proportion such "non-significant" clubbing formed of the total number of patients discovered during the same period to have clubbed fingers. It may be that some of these "non-significant" cases may ultimately provide the key to the problem, but at present there seems to be a plethora of clinical clues: what is needed is the physiological approach. Apart from the work of Mendlowitz it is remarkable to what small extent the physiological methods introduced into clinical medicine by men like Lewis have been applied to this problem and how few are the physiological clues, compared with the wealth—the frozen wealth—of clinical data.

[1] *Amer. Heart J.*, 1947, **34**, 852.
[2] *Clin. Sci.*, 1938, **3**, 387.
[3] Kinsely, M. H., Bloch, E. H., Eliot, T. S., and Warner, L., *Science*, 1947, **106**, 431.
[4] Bensley, E. H., Rhea, L. J., and Mills, E. S., *Quart. J. Med.*, 1938, **31**, 325.

THE "HAEMOLYTIC" CRISIS

Congenital haemolytic anaemia was first accurately described almost half a century ago, and the occurrence at intervals of crises during which the red count fell catastrophically has long been recognized. The cause of these attacks has been and remains a mystery, but their sudden onset in epidemic form among affected members of a single family[1-4] has suggested an association with some infection. Since the crises occur in the course of a haemolytic anaemia, it was perhaps natural to assume that they were exacerbations of the continuous and excessive haemolysis already present, and the term "haemolytic crisis" has become hallowed by long usage. Nevertheless it was noted from time to time that there were features which it was difficult to explain on this basis. Blood destruction or loss normally

leads to the production in increased quantities of platelets, leucocytes, and reticulocytes, but in the familial outbreaks referred to one or more of these features was frequently absent. In the majority of cases about which the existing information is adequate it was rare for reticulocytes to exceed 1% for the first week or 10 days from the onset of the crisis, even though after recovery a constant reticulocytosis of 10–15% was a feature of these cases. Josephs[5] in his studies on haemolytic anaemias suggested that in addition to the haemolytic process there might be some hypoplasia of the marrow, and Dameshek[3] thought that the spleen might produce a hormone inhibiting the maturation or delivery of cells to the circulation.

A recent article by Owren[6] throws much light on the subject. He describes "haemolytic" crises occurring in six individuals, four of whom were members of one family and became ill within a few days of one another. Owren's studies show that in five out of the six cases reticulocytes were absent during the first 10 days, and that a sudden rise occurred between the tenth and twelfth days. Leucopenia, thrombocytopenia, and a decrease in serum bilirubin and urinary urobilin were also noted during the early days of the crisis. During recovery the first event was the development of a leucocytosis, followed by an increase in platelets and finally a reticulocytosis. By good chance one of the patients was fully examined both clinically and haematologically eight days before a crisis developed, and an interesting feature of Owren's paper is the series of seven photomicrographs of this patient's marrow throughout his illness. Before the crisis the marrow shows the typical erythropoietic activity seen in this disease, but red cell precursors are almost completely absent in films taken on the fourth and sixth days of the illness; by the ninth day commencing regeneration of proerythroblasts has begun to be obvious, and within a few days the marrow shows tremendously active normoblastic erythropoiesis. Owren also confirms the observation made by Dacie and Mollison,[7] who showed that the life span of the erythrocytes in congenital haemolytic anaemia is greatly reduced, being less than 14 days, compared with a normal period of 120 days. Owren confirms this finding and draws the conclusion that if marrow aplasia occurs, even without increased blood destruction, the red cell count will be halved in a week. This is precisely the finding in the case already referred to.

The latest word on the subject comes from Dameshek and Bloom.[8] They report on seven cases (of which three have already been recorded in the literature[3]), the last of the series having been most fully studied. They confirm the absence of reticulocytes at the height of the crisis and find in the marrow a nucleated red cell population consisting almost entirely of the most primitive cells—namely, pronormoblasts and basophilic normoblasts. As this "maturation arrest" passes off increasing numbers of later normoblasts are seen and reticulocytes begin to appear in the peripheral blood about the ninth day from the onset of the crisis. There is some evidence from this case and others that there is increased faecal excretion of urobilinogen during the crisis, indicating increased haemolysis. Dameshek and Bloom consider that the various features of the haemolytic crisis might be explained by an extreme degree of hypersplenism, causing simultaneously both excessive haemolysis and a maturation arrest of the nucleated red cells and thus leading to the extremely rapid development of anaemia. It is clear that much interesting work remains to be done in this condition; in any future investigation, in addition to blood and marrow studies, the measurement of urobilinogen excretion is likely to be of critical value in assessing the true importance of haemolysis in the so-called haemolytic crisis.

[1] Murray-Lyon, R. M., *British Medical Journal*, 1935, **1**, 50.
[2] Scott, A. M., *Lancet*, 1935, **2**, 872.
[3] Dameshek, W., *New Engl. J. Med.*, 1941, **224**, 52.
[4] Horne, J. L., Lederer, H., Kirkpatrick, H. J. R., and Leys, D. G., *Lancet*, 1945, **2**, 33.
[5] *Bull. Johns Hopk. Hosp.*, 1938, **62**, 25.
[6] *Blood*, 1948, **3**, 231.
[7] *Lancet*, 1943, **1**, 550.
[8] *Blood*, 1948, **3**, 1381.

HYPERSENSITIVITY TO UVEAL PIGMENT

One of the unsolved problems of ophthalmology is the aetiology of sympathetic ophthalmia, though diligent attempts to find the answer have been made for over a hundred years. Stimulus was given to the search when Elschnig,[1] of Prague, propounded his theory of anaphylaxis, a direct outcome of which was the intracutaneous test for hypersensitivity to uveal pigment. Experimenting with this test in 1934 Friedenwald[2] found that two weeks after injection of the pigment into the skin of a hypersensitive individual the histological findings in the skin—phagocytosis of the injected pigment, lymphocytic infiltration, epithelioid and giant-cell systems—were closely similar to the histological picture of sympathetic ophthalmia in the eye. Woods[3] had been working along the same lines for some years before this, and he and McPherson[4] have recently published the results of some further experiments carried out at the Wilmer Ophthalmological Institute of the Johns Hopkins Hospital. In the interpretation of the tests they chiefly rely on the histological findings in the excised skin.

The pigment solution which they use is derived from the uvea of fresh ox eyes. An injection of 0.1 ml. of the solution is made into the forearm, and in due course the area of the skin is excised and prepared for histological examination. Control studies were also made. The test was considered to be positive when it was found that all the pigment had been ingested by phagocytes and when the skin had been infiltrated by lymphocytes, epithelioids, and giant cells. In some positive cases even nodule formation was observed.

Patients with three different types of eye disease were tested. In the first group were 30 cases of alleged sympathetic ophthalmia, the majority of which were confirmed by histological examination of the excised eye. Of these cases 60% gave straight positive reactions; the remainder were doubtful or weakly positive. In the type of eye injury usually considered most likely to produce sympathetic ophthalmitis—namely, that involving the ciliary region of the globe—one of the greatest difficulties for the ophthalmologist is to know how long he can safely wait before deciding to remove the exciting eye. In this country the accepted period is about 21 days. McPherson and Woods concluded from their observations that in the majority of cases in this group the test was positive within the first month. The second group of patients consisted of 139 cases of intraocular operations or injuries involving the uveal tract; there was the usual variation which such cases show in the time and extent of recovery. None of these patients subsequently developed sympathetic ophthalmia, but the pigment-injection tests showed that of those who lost an eye as a result of the injury or operation, or had a stormy recovery with post-operative uveitis, 14% gave a strongly positive reaction. In 13% the results were doubtful and in 66% entirely negative. The third group consisted of 43

[1] *v. Graefes Arch. Ophthal.*, 1910, **75**, 459.
[2] *Amer. J. Ophthal.*, 1934, **17**, 1008.
[3] *J. Amer. med. Ass.*, 1921, **77**, 1317.
[4] *Amer. J. Ophthal.*, 1948, **31**, 35.

cases of endogenous uveal disease. None of these gave positive reactions.

Woods and McPherson believe that the mechanism of these positive tests can be quite simply explained. It has been shown that uveal pigment possesses organ-specific and lacks species-specific immunological properties. When pigment hypersensitivity occurs after an ocular injury the uveal pigment is absorbed from the eye; the cells of the body react to the pigment, and a generalized hypersensitivity ensues. In certain cases, however, absorption of pigment results in a local hypersensitive reaction in the eye with the histological findings characteristic of sympathetic ophthalmia. In those cases in which the result of the test is positive but sympathetic ophthalmia does not occur the mechanism of sensitization is the same, but the process stops when further absorption of pigment from the eye ceases, and no local hypersensitive reaction takes place. The eye is then affected only by a non-specific endophthalmitis. Woods and McPherson suggest one or two possible theories to account for sympathetic ophthalmia, but the problem still remains, and the current theory that the cause may be some obscure infective process activated under certain conditions cannot be discarded. The ophthalmologist may, however, gain some moral support in a doubtful case from a positive intracutaneous hypersensitivity test when deciding upon such a grave step as enucleation.

HEAT AND BLOOD FLOW

It has been a generally accepted axiom that one of the effects of heat is to increase the circulation in that part of the body to which it is applied. Some doubt about the accuracy of this concept has arisen as the result of recent work in the U.S.A. Kemp and his colleagues[1] at the University of Iowa heated the hind limbs of anaesthetized dogs with short-wave diathermy and measured the rate of flow in the femoral artery and vein by means of a bubble flow-meter. They used a thermocouple to measure changes in the deep temperature, and they found that short-wave diathermy producing a definite rise in muscle temperature failed to increase the blood flow in either artery or vein. In fact they state, "In many experiments a significant decrease in the volume of blood flow was observed." The anaesthetic was not found to be responsible for this result, and a decrease of blood flow on the application of short-wave diathermy also followed if the limb had been previously denervated. On the other hand, heating by means of microwaves according to the technique worked out by Krusen and his colleagues[2] was found to result in an increased blood flow. Kemp and his colleagues make it clear that their findings refer only to the circulation in the main artery and vein and not to the collateral circulation. In addition their results might have been affected by the anaesthesia, the use of heparin as an anticoagulant, and the sectioning and cannulation of blood vessels. In discussing the contradictory results of heating with short-wave diathermy and with microwaves they suggest that these thermogenic agents may have other effects besides heating. Possibly short-wave diathermy causes an increase in peripheral vascular resistance due to increased sensitivity of the contractile elements in the blood vessels. Thus the beneficial effects of this form of treatment may be due to a decreased rather than an increased circulation. It is also possible that the findings in the anaesthetized dog may not be comparable to those in spastic states of the vasomotor and skeletal systems.

[1] *Arch. phys. Med.*, 1948, **29**, 12.
[2] *Proc. Mayo Clin.*, 1947, **22**, 209.
[3] *Arch. phys. Med.*, 1948, **29**, 17.

The effect of diathermy on the blood flow in the forearms of normal men has been studied by C. S. Wise,[3] of the Harvard Medical School. He measured the blood flow by means of a plethysmograph and used both condenser field and induction cable application of diathermy: with both methods he obtained evidence of increased blood flow in the limb. He concluded that this was the result of the thermal effects of the short waves and not of any specific effect on the blood vessels. Wise was aware of the contrary results obtained by Kemp and his colleagues, and to account for the difference he suggests that the flow in the femoral artery may not be an accurate indication of the flow in the limb as a whole, and also that the flow in peripheral vessels may be increased while that in the central vessels may be decreased. These two papers are of great interest. While the authors of both agree that deep heat is a valuable therapeutic agent they are not agreed on the mechanism by which its effects are obtained. Work such as this will lead to a more exact knowledge of the physiological and therapeutic effects of physical agents.

BONE GRAFTS

During the years after the war much valuable experience has been gained in military and other hospitals as the result of the large numbers of bone-graft operations done to secure union in difficult fractures. A follow-up study on 358 cases has recently been carried out by Bishop, Stauffer, and Swenson[1] in order to determine the indications for the use of the various types of bone grafts. The injuries for which treatment was required were mainly severe gunshot wounds of the extremities, and full-thickness skin grafting was necessary in 21.2% of these cases before bone replacement could be attempted. Union was judged on the clinical and radiological findings. Inlay grafting, which was used at first, was steadily replaced by massive dual onlay grafting, since this was found to be more effective. The procedure was to strip the periosteum off the bone ends in order to provide a continuous sheet; the fibrous tissue between the bone ends was then removed, and the latter were freshened. The marrow cavity was cleaned out with a curette in order to promote endosteal bone formation. The gap between the bone ends was packed with cancellous bone from either the upper tibia or the iliac crest, and massive dual onlay grafts were fixed rigidly in position by machine-type screws, which were considered essential in order to allow early joint motion at the sixth week. Where additional strength was required, plates and screws were used, but never as a substitute for bone grafts.

Of the patients in this series 10.9% had inlay grafts, 40.2% had onlay grafts, and 48.9% had grafts of the dual onlay type. In 318 cases the grafts were followed to union, the average time being 20 weeks. The slowest to heal were inlay grafts, averaging 27 weeks; onlay grafts required on an average 20 weeks, and the dual onlay variety only 19 weeks. Factors causing delay in union were decalcification of bone ends, sclerosis of the major fracture fragments, large bone defects which had to be bridged, infection, poor apposition, fracture of the graft, and poor fixation of the grafts in defects near a joint. Some failures also occurred with short grafts. It is claimed that adequate fixation of the grafts with screws will allow movements at the adjacent joints at an early date and will thereby diminish the time required for rehabilitation. In general the authors regard dual onlay grafting as the method of choice, being indicated particularly when decalcification or sclerosis is present, when the bridging of a gap is necessary, and for use near a joint. Rigid fixation of the graft is essential.

[1] *J. Bone Jt Surg.*, 1947, **29**, 961.

THE JOHNS HOPKINS SCHOOL OF SURGERY

HUNTERIAN LECTURE BY DR. JOHN M. FINNEY, JUN.

The Hunterian Lecture, delivered before the Hunterian Society at the Mansion House, London, on Jan. 17, was by Dr. John M. Finney, jun., of Johns Hopkins Hospital, Baltimore, whose subject was the founding and influence of the Johns Hopkins School of Surgery, and especially the work of William Stewart Halsted (1852–1922), the first professor of surgery there. Dr. Finney recalled that 22 years ago his father delivered a Hunterian Lecture at the Mansion House, when his subject was the influence of John Hunter on early American surgery. On this occasion he proposed to speak of Halsted and his pupils, who might be said to occupy the same position as Hunter and his trainees 150 years ago. The foundation of Johns Hopkins practically coincided with the understanding of the bacterial origin of infection and disease and the development of Listerian methods of control.

Halsted was born in New York and trained in the College of Physicians and Surgeons there, graduating in 1877. In 1878–80 he spent two years in Europe and brought back with him many new ideas gained in Continental clinics. He was chosen to organize the services in the newly founded New York Hospital. He was a bold and original surgeon, an inspiring teacher, an omnivorous reader, an extraordinarily hard worker, accepting responsibility as a surgeon for six widely separated hospitals, and at the same time maintaining a "quiz" of 60 or more students at his house. Among other things he was a pioneer in the method of "refusion" of blood. He also carried out one of the earliest operations in America for gallstones; this was performed on his mother in 1882, when he incised the gall-bladder and extracted seven stones. He was a fearless experimenter, and one of his experiments led to personal tragedy. In 1884 he was investigating the use of cocaine solutions in the eye to produce anaesthesia of the conjunctiva and cornea. He and two of his assistants experimented upon each other and found that pain impulses could be abolished—the first demonstration of nerve-block anaesthesia. Several of the students in the "quiz" were gradually included in these innocent experiments, but the unfortunate outcome was the creation of a group of cocaine addicts, amongst them Dr. Halsted, and Halsted alone seemed to have returned again to a useful though much altered life. After great efforts he freed himself so far as cocaine was concerned, though there seemed to be evidence, said Dr. Finney, of some dependence on small but not increasing doses of morphine during the rest of his life.

He emerged from these trials a greatly changed man. He had been a restless and tireless worker, spending himself in endless operations, teaching day and night, controlling services in several hospitals; but after this interval he began to live a much more thoughtful and leisurely life, with time for reflection and contemplation, and no doubt in the end his work was far more fruitful than it could have been had he proceeded at his previous pace. In 1886, knowing of his struggle, Dr. W. H. Welch invited Halsted to work in his laboratory at Baltimore. Halsted devoted himself to operative procedures and the treatment of wounds, making careful microscopical studies of wounds, paying attention particularly to exact approximation of surfaces and the avoidance of dead spaces, and studying also the organization of blood clot.

Professor on Probation

Although his personal battle against drug addiction had not been quite won when the Johns Hopkins Hospital was opened in 1889, Halsted was chosen for the chair of surgery, for a time on a probationary basis. Within three years he was recognized as surgeon-in-chief of the hospital, and this for him personally was as great a triumph of will power and fortitude as of surgical ability and skill in investigation. Dr. Finney gave an amusing account of the laconic interview with Halsted at which his father was informed that he had been selected as surgical assistant, also of the elder Finney's reactions on going from Massachusetts General Hospital, which was rich in tradition, to the Johns Hopkins, which had no tradition at all but was looking very eagerly into the future.

Halsted was not a very skilful operator, lacking dexterity in the use of his hands, but he made up for it by his intellectual grasp of the principles of surgery and his meticulous care for detail. In his treatment of the staff he was an individualist, insisting on each man carrying out his own investigations with as little assistance as possible. He encouraged his assistants to go into the laboratory as well as into the ward. Shortly after the opening of the hospital he made a striking contribution to surgical technique. In the winter of 1889–90 the nurse in charge of his operating room complained that the solutions of mercuric chloride produced a dermatitis on her arms and hands. Halsted gave the matter consideration and got a rubber company in New York to supply a special rubber glove, so introducing this article, though at first only for the protection of the skin, into the operating theatre. The circumstance had a second result: the nurse for whose protection the glove was devised became Mrs. Halsted.

Dr. Finney said that for 23 years his family lived only a block away from the Halsted home in Baltimore, and he could remember seeing again and again Dr. and Mrs. Halsted, he the picture of sartorial perfection, setting out in some state in their carriage. There was an indefinable something about Halsted which set him apart from ordinary people. In all the 33 years in which he was closely associated with the lecturer's father the latter was never completely at ease in his presence, nor did they ever reach any common ground of mutual understanding and real friendship. There was always a stiffness about Halsted which prevented any real cordiality, and that was true of Halsted's relations with all the members of the medical faculty, with the exception of Welch. Polite respect was the rule; personal intimacy was non-existent. Halsted rarely awarded praise—an exception was his praise of Harvey Cushing—and he could be severe in his censure and in the penalties which he imposed. Dr. Finney told other stories of Halsted's peculiarities. All his suits were made in London and ordered several at a time. His personal linen was not only purchased in Paris but sent back to be laundered there. He picked out the hide from which his shoes must be made. His open fires, of which he was inordinately fond, were fed by white oak specially shipped from the Carolina mountains. Was it any wonder that his operative technique was similarly fastidious, that he should spend two hours on the repair of an inguinal hernia, three hours on a thyroidectomy, six hours on an operation on the breast?

But his influence as the maker of a school was far-reaching, and of the 17 men who served as resident surgeons under Halsted 11 attained professorial rank in some medical school, and the same was true of many of his other assistants. It could be said that, thanks to Halsted's influence, there developed a new school of surgery which spread over the country as men trained in it went out to take responsible posts elsewhere. Halsted's own contributions, especially to the radical treatment of cancer of the breast, were classics, but greater than anything he himself did in surgery was his influence on others, on his pupils, and on those whom they in their turn taught.

In some brief discussion following the lecture Mr. Dickson Wright said that it was encouraging that a man of Halsted's angular and difficult temperament should have been able to found such a school. It was clear that a great teacher need not necessarily be an extrovert. Mr. Mortimer Woolf was reminded of Halsted's likeness to John Hunter, though Halsted, of course, had the benefit of scientific methods and institutions. Sir Gordon Gordon-Taylor added a few words of appreciation.

The Northern Ireland Ministry of Health has issued a booklet entitled *The Future Mental Health Service of Northern Ireland* (H.M.S.O., 1s. 6d.) explaining the provisions of the Mental Health Act, 1948. It gives a broad picture of the details required of the authorities concerned in its administration. Mr. William Grant, Minister of Health, explains in a foreword that the passing of this Act is only the beginning: "I should like to assure the people of Northern Ireland, if any assurance is necessary, that both the Northern Ireland Hospitals Authority and my Ministry intend to press forward energetically with the expansion of the Mental Health Service authorized by the Act."

Reports of Societies

AETIOLOGY OF DENTAL CARIES

At a meeting of the Section of Odontology of the Royal Society of Medicine on Jan. 24 there was a discussion on the aetiology of dental caries. Dr. SHELDON FRIEL was in the chair.

Mr. G. J. PARFITT spoke of this as a debatable question. Was the important factor the physical properties of the food or the structure of the teeth? Was only one factor concerned or were there many? The study was complicated by the varied manifestations of caries, differences in the speed of the process, the fact that all the members of some families were free while in other families there seemed to be a general susceptibility, the higher incidence among town dwellers, the special liability to caries of persons working in certain occupations, and the appearance or increase of caries among primitive peoples on coming in contact with civilization. All this suggested that a diversity of factors were concerned.

If diet was accepted as having an effect on incidence, was this a nutritional effect or was it due to the contact of certain food substances with the teeth? A correlation between caries and variations in the contents of the saliva had been shown by some workers; others had suggested that there was little correlation. The chemical and physical properties of the saliva seemed to have some effect, but did not explain susceptibility or immunity. One curious circumstance was that during the war the children of the Channel Islands who remained at home suffered from caries only to about half the extent of those who were evacuated to England and lived on English food; the latter had caries to about the same extent as English children. It had been shown that supplementary foods for expectant and nursing mothers might prevent caries in the offspring, but no extravagant claims could be made. Experiments in Oslo showed that with antenatal care of the mother and care during the pre-eruptive stage (the first year) of the child's existence there was less caries or more delay in the appearance of caries than among children who had received only post-eruptive care. Ingestion of fluorine in drinking-water during tooth formation was thought to diminish the likelihood of caries, but there was no effect after the teeth had formed. Ingestion of calcium phosphate or vitamin D was declared to have some effect on the teeth after eruption. Some workers had reported an arrest of dental caries and an almost complete suppression of caries incidence in children on a controlled diabetic diet. Some considered that ample ingestion of protein was essential to give protection against caries. An adequate supply of vitamin C was at one time thought to reduce caries by 50%, but further trials did not support that view.

Effect of Carbohydrates

In considering the local environment the question of food left to stagnate in the teeth was an important one. The site, number, and size of the stagnant areas, the influence of mastication, and the arrangement and occlusion of the teeth had to be taken into account. With highly refined foods the scouring effect was missing, and mastication was less vigorous. Methods of preparing food which induced stickiness and a liability for particles to remain about the teeth were contributory. A considerable degree of acidity could exist in the mouth and etch or soften the enamel. But although caries commonly occurred in the areas of stagnation, not all stagnation areas became carious. Sugars had been considered bad for the teeth, and the idea that refined carbohydrates were connected with the production of dental caries had many points in its favour. Bakers and confectioners exposed to refined carbohydrate dust were said to show a high incidence. When consumption of refined carbohydrates was reduced, as in wartime, the caries incidence also was reduced. Refined carbohydrate was an accessory cause which could not be ignored.

As for the bacteriology of dental caries, a vast number of different bacteria were commonly present in the mouth, and many organisms in pure culture produced acid by fermenting carbohydrates. Observations showed that the presence of the lactobacillus was correlated with the carious process, though other organisms took part. Finally, Mr. Parfitt touched upon the new idea of proteolysis. The fact that the carious process affected the enamel slowly and the dentine more rapidly had been taken to indicate that the process was proteolytic in nature. Amid this crowd of hypotheses he would suggest only that the initial attack on the enamel surface was the all-important matter in the consideration of dental caries.

Professor H. H. STONES said that with present knowledge the theory that the initial stage was brought about by the production of acid still held the field. Why did certain types of persons and certain animals get dental caries and others not? Caries increased among the Eskimo when they came into contact with civilization, but that applied particularly to children and not to those of mature age. He thought that alterations in diet were significant. It was noteworthy that caries was now increasing in Norway, along with increased sugar consumption. He asked whether Mr. Parfitt considered that the small white patches seen on the enamel were a sign of commencing caries.

Dr. A. B. MACGREGOR asked what the "refinement" of carbohydrate meant. It did not mean that there was less carbohydrate. As for sugar, ancient man had caries before sugar was discovered.

Mr. PARFITT replied that white patches on the enamel, especially if there was a little roughening or alteration of the surface, generally indicated the beginning of caries. The refinement of carbohydrates meant usually the removal of protein, and with this went a lot of fibre and considerable alteration of substance. Fine carbohydrate was supposed to be much more acid than when mixed with protein, fat, and certain vitamins.

CHEMOTHERAPY OF TUBERCULOSIS

A meeting of the Fine Chemicals Group of the Society of Chemical Industry was held at King's College, London, on Jan. 18 for a discussion on the chemotherapy of tuberculosis. Sir JACK DRUMMOND presided.

Dr. JAMES WALKER said the tubercle bacillus was acid-fast, and one of its characteristics appeared to be a relatively high content of lipoid material, though there was no evidence of a continuous lipoid membrane around the bacillus, a theory which was fairly widespread. A number of metabolic products had been isolated, and one of these, mycolic acid ($C_{88}H_{176}O_4$), was the compound chiefly responsible for acid-fastness. But while some of the metabolic products of the tubercle bacillus had been demonstrated, it was not known as yet by what metabolic pathways they were produced. The growth of the tubercle bacillus was relatively slow. It was a common experience for recently isolated strains to require to be cultured several times before growing well in the test tube.

Tuberculosis was unlike any of the other bacterial infections with which chemotherapy had to deal. When small numbers of staphylococci or streptococci were introduced into the body they were dealt with by the phagocytes, and the host was unaware of the incident; the tubercle bacillus could live and even multiply within the phagocytes. With tuberculosis, again, the direct method of investigation by going straight to the experimental animal had the disadvantage that the disease had a long course.

Koch reported many years ago that gold cyanide inhibited the bacillus *in vitro* in a concentration of 1 : 2,000,000, but it had no effect *in vivo*. Not until many years later was this explained by the fact that gold-protein compounds did form in the body. The best-known gold compound was sanocrysin, which was introduced in 1924 and was received everywhere with uncritical enthusiasm. Gold had now almost disappeared from the current literature of tuberculosis. Since 1935 the advent of the sulphonamides had redirected the therapy of bacterial diseases generally. The speaker gave a brief review of the work done on the various compounds, concluding with a reference to antibiotics and especially streptomycin.

Clinical Aspect

Dr. P. M. D'ARCY HART said that it was important to discover some order in the use of substances offered for combating tuberculosis. Only a minority of such substances had been found to have any effect on experimental animals, but some which had low or no activity in the test-tube might

be active in the body. The guinea-pig was usually employed for the study of tuberculosis; its disadvantage was that for screening purposes it required a relatively large amount of the drug. The mouse had been used experimentally, but it was generally more resistant to tuberculosis than the guinea-pig. The advantages and disadvantages of extreme susceptibility on the one hand and considerable natural resistance on the other in testing drugs in tuberculosis were being studied. It seemed that the use of guinea-pigs, laborious as the process was, was still the most fruitful method.

He went on to speak of the groups of substances which had been tested recently on experimental tuberculosis in animals or clinical tuberculosis in man with positive results. The first group consisted of the sulphonamides and sulphone compounds. Then came fatty acids, then aromatic compounds, followed by certain miscellaneous organic compounds, and finally the antibiotics. The list included purely synthetic substances, such as sulphones, on the one hand, which had been created in the laboratory, and on the other hand products which so far had not been synthesized and existed only in nature. Only about half a dozen substances had been found to have positive results in clinical tuberculosis in man. Of the sulphonamide group, promizole and sulphetrone were the two most popular at the moment. Another compound fairly widely used was para-amino-salicylic acid. Among the miscellaneous organic compounds was calciferol. The antibiotics included conspicuously streptomycin. He also put in the list of antibiotics cepheanthine, described by certain Japanese workers as almost miraculous in its activity, but, according to a recent report from America, having no activity in the guinea-pig.

For the benefit of an audience mainly non-medical Dr. Hart gave a brief account of tuberculosis and its manifestations, and then examined in turn the various compounds which promised positive results in human tuberculosis. Several hundred sulphone compounds had been tested in the laboratory and a number in man. The clinical results indicated some regressive effect, but he thought it was fair to say that no definite place had been found for these drugs when used alone. The use of the sulphones with streptomycin might be more promising.

Clinical trials with para-amino-salicylic acid had been in progress in Sweden, and there had been a few sporadic investigations in this country. At the moment it would be unwise to come to a conclusion about the value of this drug in tuberculosis. With calciferol dramatic and consistent improvements had taken place in the therapy of lupus vulgaris. The effectiveness of this therapy was discovered simultaneously in France and in this country during the war. It was not clear how calciferol worked; possibly it worked on the host and not on the bacterium.

Streptomycin

The discovery of streptomycin, Dr. D'Arcy Hart continued, was of historical importance because of its low toxicity, which permitted its use in effective doses in animals and man. Streptomycin was water-soluble and yet apparently would pass readily into the cell. It was effective, at least temporarily, in a small proportion of the acute forms of tuberculosis, such as tuberculous meningitis and acute miliary tuberculosis, which had hitherto proved almost invariably fatal. It had a limited effectiveness in renal tuberculosis, but appeared to be of little value in the more chronic forms of lung disease.

Concerning the toxicity of the other agents, promizole might produce after a long period thyroid enlargement and sexual changes. Para-amino-salicylic acid had little systemic toxicity, though the large quantities which had to be taken complicated its use. Streptomycin, though of low toxicity, had the disadvantage that resistant strains of bacilli emerged during prolonged treatment. Attempts to prevent the appearance of such strains had been made by combining streptomycin with other agents, but no conclusive results were as yet forthcoming. The difficulty in assessing the clinical usefulness of drugs in tuberculosis lay in the large doses in which they had to be used in man as compared with experimental animals, the protean manifestations of the disease, its chronicity, and its tendency to natural recovery. Chemotherapy was only one approach to the problem. The older methods of treatment and social prevention had a great part to play. It looked as if the weapons required for the conquest of tuberculosis were as varied as the pathological manifestations themselves.

In the course of some discussion Sir JACK DRUMMOND said that it appeared that the limiting factor in studies on potentially valuable compounds was the absence of a thoroughly satisfactory screening test less laborious and time-consuming than the guinea-pig test. He had been interested to hear of trials in Sweden on para-amino-salicylic acid, and he asked whether the Medical Research Council intended to make similar tests under adequate control. Dr. HART said that that was being done, and it was also under consideration whether a combination of para-amino-salicylic acid and streptomycin might be of service in preventing the emergence of resistant strains.

Several contributions to the discussion were made by biochemists, one of whom said that there was little doubt that the lipoid complex of the organism had extraordinary chemical and physico-chemical properties, with the capacity to inhibit activity over a very wide range of antibiotic substances. The tubercle bacillus would stand 40% sulphuric acid for an hour and 10% for twenty-four hours without being killed. Evidently there was some significant mechanism which prevented quite small ions from getting to the cell.

Another speaker, Dr. O'CONNOR, said that the greatest advances in therapy would come only from much closer co-operation between organic chemists, biologists, and medical men. The organic chemist was often working in the dark owing to his non-appreciation of the biological problems involved. In America organic chemists had made a slight modification of streptomycin, and according to American reports the toxicity of the modified product had been further lowered. Another approach which organic chemists might make to the problem was in devising adjuvants which might be administered to enhance the activity of the principal drug. With para-amino-salicylic acid, clinical trials had shown that within as short a time as three or four days the patient's general condition improved considerably; it looked as if the toxins in his body were to some extent neutralized, so that possibly the natural body resistance was then enabled to cope with the virulent bacteria.

CAUDAL ANALGESIA

At a meeting of the Edinburgh Obstetrical Society on Jan. 12, with the president, Dr. E. CHALMERS FAHMY, in the chair, papers were presented by Dr. A. F. ANDERSON and Dr. J. D. BOURKE.

Dr. Anderson, discussing caudal analgesia, described the anatomical features of the sacral canal. He reviewed the pharmacological effects of local anaesthetic injected extradurally in this region and discussed the interference with such effects resulting from abnormalities of development of the sacrum, of which he showed a number of radiographs. He then recorded his personal introduction to this subject, and indicated how he had concluded that in this country the method should be restricted to hospital practice, and that the constant attention necessary for success with a continuous technique was so exacting as to make it applicable to very few patients indeed. He had therefore decided to restrict his investigations to the use of a single dose using procaine to determine the quantity of anaesthetic necessary to secure the desired effect and then giving a second injection through the indwelling needle of a similar quantity of amethocaine hydrochloride solution with a view to prolonging the effects of the procaine. With this technique he had found it possible to obtain relief of pain lasting from three to five hours. The factor most vital to success was the timing of the injection to allow of delivery occurring within this range. Dr. Anderson described the technique of the caudal injection, and subsequently discussed indications and contraindications. Of the former, he thought the need to relieve pain in premature labour was the most important. He thought the method should be in the hands of an obstetrician or of a specialist anaesthetist with very wide experience of practical obstetrics. He recorded the results of 67 cases personally treated.

Anaesthesia for Caesarean Section

Dr. Bourke discussed the difficulties facing the anaesthetist in choosing an anaesthetic for caesarean section. Many caesarean sections were in patients who were already suffering

from serious disorders peculiar to pregnancy or to parturition, from pre-eclampsia, starvation, and acidosis; from grave ante-partum haemorrhage; or from diabetes, tuberculosis, or other incidental disease. Many were emergencies, where reasonable pre-operative preparation could not be attempted. Many patients were suffering from a degree of gastric dilatation and were liable to vomit large quantities of material suddenly. Sedative pre-medication, which might prejudice the foetus, must be eschewed. Finally, the presence of a large tumour within the abdomen and the insistence of some operators upon a steep Trendelenburg position interfered with diaphragmatic respiration. Spinal analgesia had a sinister reputation, possible reasons for which Dr. Bourke examined in detail. Nevertheless it had certain advantages, and there was a place for it, especially when supplemented by light general narcosis. Inhalational anaesthetics were undoubtedly the most frequently employed. A possible objection was that most general anaesthetics depressed the activity of the uterine muscle. This risk could be minimized by the use of cyclopropane at a very light plane along with curare, which provided necessary relaxation and minimized the total dose of the agent used, so reducing its toxic effect. It appeared that significant quantities of curare did not cross the placental barrier, but not more than 10 mg. should be given. In the series of cases which Dr. Bourke now recorded the results for the babies had been quite favourable, most breathing well at once and all crying within eight minutes. Local infiltration analgesia was indicated in those cases where there was gross foetal distress, when no form of anaesthesia which might affect the foetus, however remotely, should be employed. Caution was required in applying this method to obese patients, who might require such a large infiltration that toxic effects might appear, while wound healing was sometimes poor. The inhibition of sulphonamides by procaine solution had also to be remembered.

These papers were discussed by Dr. JOHN GILLIES, Dr. D. S. MIDDLETON, Dr. W. F. T. HAULTAIN, Dr. R. DE SOLDENHOFF, Dr. SUZANNE PATERSON, Dr. CAROLINE ELLIOTT, Dr. W. I. C. MORRIS, Dr. ALISON RITCHIE, Dr. F. G. GIBBS, and the president.

HARVEIAN SOCIETY OF LONDON

The annual general meeting of the Harveian Society of London was held at Manson House, 26, Portland Place, W.1, on Jan. 19. The Buckston Browne Prize for 1948 was presented to Dr. V. C. Medvei by the president, Mr. E. G. Muir. The honorary treasurer, Sir Cecil Wakeley, made his financial statement and announced that the society had benefited to the extent of £7,250 by a bequest of the late Sir Norman Gray Hill. The president then read his address, "A History of Surgery." New Year greetings were conveyed to the meeting from Professor Sven Johansson, of Sweden, a foreign corresponding member of the society. The officers for 1949 were elected, Dr. Desmond MacManus being inducted as president.

The London County Council has recently published the *Statistical Abstract for London, 1937–1946* (with 1947 figures where available). The information contained in this volume is entirely statistical, and the subjects range from infant mortality to liquor licensing, and from horse-cabs to the number of meals served in civic restaurants. Among the items of medical interest relating to the year 1946 are the following: The estimated population in the administrative county of London was 3,109,240, which was over three-quarters of a million more than in 1941. The birth rate was 21.2 and the crude death rate 12.6. The infant mortality rate was 38 per 1,000 live births. "Violence" was given as the cause of death of 141 infants under one year of age. There were 1,622 children attending special schools for physically handicapped children, and 1,823 children attending special schools for educationally subnormal children. The number of voluntary hospital beds was 17,424, and L.C.C. hospital beds, excluding those in mental hospitals, numbered 33,762. There were 620 admissions to hospital for diphtheria; this compares with 6,094 in 1938. There were 379 suicides, compared with 594 in 1938. The total number of patients certified under the Lunacy Acts was 20,604, and there were in addition 2,171 voluntary patients in the mental hospitals. There were 11,651 certified mental defectives. Traffic accidents caused 691 deaths, compared with 1,458 (the highest total ever reached) in 1933. The report reveals that 18,688 civilians were killed in air raids in the administrative county of London during the war.

Correspondence

Haemolytic Disease of the Newborn

SIR,—I should like to express my appreciation of the valuable contribution to the knowledge of haemolytic disease of the newborn made by Dr. P. L. Mollison and Miss Marie Cutbush (Jan. 22, p. 123). This paper demonstrates once more that routine serological tests during pregnancy are absolutely essential, and in addition shows the importance, if the newborn child is likely to be affected with haemolytic disease, of close co-operation between the obstetrician and the paediatrician so that the haemoglobin and bilirubin values of cord blood can be estimated directly the child is born and the appropriate treatment undertaken.

I have always maintained that haemolytic disease of the newborn is a disease of the foetus and not one that "comes on" after birth, even although some of its manifestations become more obvious shortly after that event. I could never, however, explain to my own satisfaction the sudden onset of a severe haemolytic anaemia some days after birth in an apparently normal baby, nor does the explanation now put forward by Dr. Mollison and Miss Cutbush completely satisfy me. According to them, estimation of the cord haemoglobin shows that these infants are actually anaemic at birth and that "in fact the haemolytic process is maximal at birth." I wonder if their observations refer to babies suffering from hydrops foetalis and anaemia and not to those who have haemolytic anaemia of the newborn. I raise this point because in the cases to which they refer death occurred within 24 hours of birth, whereas the infants of whom I am thinking appear normal for a few days after birth and then suddenly develop an intense anaemia which can usually be cured by simple transfusion with Rh-negative blood.

The authors also suggest that "the incidence of kernicterus is closely related to the haemolytic process," but, if this be so, why is there only a trace of jaundice and never kernicterus in this type of haemolytic anaemia of the newborn and in the acute haemolytic anaemia of older children? They quote me as suggesting an opposite view—namely, that there is "an inverse relationship between the degree of blood destruction and the development of kernicterus"—but I have never made that suggestion. What I have said is that I have never found "any parallelism between on the one hand the degree of the haemolysis and on the other the severity of the jaundice and the presence of kernicterus." Dr. Baar and I believe that we have shown that the jaundice in haemolytic disease of the newborn is due to liver damage and that the kernicterus is a sequel of such liver damage and therefore not "closely related" to the haemolytic process.

We believe that the changes in the brain occur during foetal life and not, as the writer of your leading article suggests, after birth, but that in those children who are born unjaundiced the actual staining may not take place until jaundice develops after birth. We have seen kernicterus in a child who died 18 hours after birth, a considerably shorter time than the 2 to 5 days mentioned in the paper.

There is one other point in the paper on which I wish to comment. This is the statement that "it is surprising that so much stress has been laid on blood destruction as a cause of the anaemia to the complete exclusion of any consideration of changes in the amount of production." Actually in our earliest papers on this subject my colleagues and I stressed the fact that this disease was a disease which not only produced haemolysis but also one which affected the erythropoietic centres, and that the purpose of blood transfusion was to tide these centres over their "aregenerative" phase and thus enable them to recover. It was for this reason that we originally spoke of the disease as "erythronoclastic" rather than "haemolytic," thus indicating that the whole erythron was affected. We still hold this view, only now we should add to it that, although erythronoclasis is the commonest manifestation of the disease, the antibodies also affect the liver and sometimes indirectly the brain, kernicterus being in our view a hepatic encephalopathy.

These criticisms are not intended in any way to underrate the great value of this paper, for which once more I thank the authors.—I am, etc.,

Birmingham. LEONARD G. PARSONS.

Early Diagnosis of Tuberculosis

SIR,—As a general practitioner I have been particularly interested in the correspondence which followed the publication of Dr. Peter Stradling's paper, "The Practitioner's Part in the Anti-tuberculosis Scheme" (Nov. 6, 1948, p. 832). The purpose of this letter is to draw attention to the usefulness in general practice of testing for tuberculin sensitivity, a simple procedure that can be regarded as complementary to radiography of the chest, and no less important, though its scope and significance are different.

Primary tuberculous infection in children is easy to overlook, because it often appears in such an apparently innocent guise as a brief self-limiting febrile illness, slow recuperation after whooping-cough, or vague ill health without localizing symptoms or signs. It is in such cases that tuberculin skin tests can be so informative and helpful in selecting patients for further investigation in hospital. The tests are quick and easy to perform, and have the additional merit, important in general practice, of being almost entirely painless. My own procedure as a rule is to carry out a jelly test first; then, if that is negative and further precision seems necessary, to do an ordinary intradermal Mantoux test with a 1 in 1,000 dilution. It is important to bear in mind that the result of either of these tests is never more than a pointer.

During the last six months I have tested 19 children on a suspicion of tuberculosis. Among these, 3 out of 18 jelly tests and 2 out of 9 Mantoux tests have been positive. Some illustrative cases are described briefly below.

(1) A girl aged 11. Night sweats for several months. Tired and irritable recently. Mantoux (1:1,000) positive. Radiograph of chest shows a large root shadow.

(2) A girl aged 9. For 10 days P.U.O. up to 103° F. (39.4° C.), characterized by tachycardia out of proportion to degree of fever, but otherwise by remarkably little constitutional disturbance. Tuberculin jelly test positive. Radiograph of chest shows well-marked primary complex.

(3) A boy aged 3. Measles and whooping-cough last summer. Fluctuating enlargement of cervical glands on both sides recently. Tonsils unhealthy. Tuberculin jelly test positive. Radiograph of chest normal. Diagnosis probably tuberculous tonsillitis and adenitis with superimposed secondary infection.

(4) A girl aged 10. Tired for a year. Faint in the morning. Overgrown weedy child with marked lumbar lordosis. Tuberculin jelly test positive. Radiograph of chest normal, and E.S.R. 10 mm. Positive test probably a legacy of a past infection and irrelevant to present condition.

(5) A boy aged 3. Poor recovery from whooping-cough, with failure to regain weight, and persistent cough. Bad home conditions. On examination, coarse crepitations over both lower lobes. Jelly test and Mantoux (1:1,000) both negative. Radiograph of chest showed increased markings at both bases. Full recovery at convalescent home.

(6) A girl aged 4. Poor recovery from whooping-cough with repeated coughs and colds. Home very damp. Fragile and pale, but no localizing signs. Jelly test and Mantoux (1:1,000) both negative. Further investigation not considered necessary at this stage. Child kept under observation and improved on symptomatic treatment.

Even this small series of cases gives some idea of the value of the procedure.—I am, etc.,

Oxford. G. A. BALLANCE.

Diagnosis of Tuberculous Meningitis

SIR,—Dr. J. T. Lewis (Dec. 11, 1948, p. 1036) advocates the recognition of lowered cerebrospinal-fluid glucose as an early diagnostic sign in tuberculous meningitis.

A simple clinical test based on this fact has been in use in the hospitals in this area for over 14 years. The reagent employed is a 25% solution of Fehling's A and B. Equal quantities of the reagent and cerebrospinal fluid are taken, boiled, and mixed. A clear cerebrospinal fluid which fails to reduce the Fehling's solution is almost pathognomonic of tuberculous meningitis. The only other conditions in which it occurs are rarely in lymphocytic choriomeningitis and in extremely rare torula infection of the nervous system.

This test and its significance were taught me as a student by Dr. Emrys Harries, lecturer in infectious diseases in the Welsh National School of Medicine, and I have used it on numerous occasions and proved its reliability.

—I am, etc.,

Whitchurch, Glam. P. T. BRAY.

Amethocaine Hydrochloride

SIR,—Mr. C. A. Jackson's excellent article on amethocaine hydrochloride (Jan. 15, p. 99) serves as a reminder of the lethal potentialities of this otherwise admirable anaesthetic agent. In the thoracic unit of Frenchay Park Hospital prior to bronchoscopy the average premedication is pentobarbital (oral) 1½ gr. (0.1 g.) at 45 minutes, and "omnopon" ¼ gr. (11 mg.) and atropine 1/100 gr. (0.65 mg.) at 30 minutes.

The use of atropine would appear to be desirable, as it is difficult successfully to anaesthetize a mucous membrane which is liberally washed with saliva. In such cases a much larger dose of amethocaine might be necessary. Excess secretion in the bronchial tree renders diagnostic bronchoscopy considerably more difficult, and furthermore, as Langton Hewer[1] states, "the passage of tracheal tubes under light general anaesthesia only can give rise to reflex disturbances of the respiratory and circulatory mechanisms." These reflexes, though subdued by topical analgesia to the cords, may still give rise to cardiac arrhythmias and even possibly to cardiac arrest. On the assumption that the reflexes are of vagal origin it would again seem desirable to use atropine as a premedicant.

I usually endeavour to complete the topical analgesia for bronchoscopy with 80 mg. of amethocaine in 2% solution—i.e., 4 ml. of this solution without adrenaline. The operative technique is much the same as used by Mr. Jackson. We do now, however, completely omit the 65 mg. lozenge of amethocaine, as we have found that either the tablet is not dissolved in an atropinized mouth, or else, if it is dissolved, a very inadequate degree of analgesia is produced which cannot be compared with the analgesia we can secure with the same dose—i.e., 3¼ ml. of 2% amethocaine—applied deliberately. During the period of use of this lozenge of amethocaine the house-surgeons reported about eight cases of very mild overdosage of amethocaine in about 550 cases, but since abandoning the use of these tablets we have not seen any comparable number of reactions in an admittedly small number of cases.

As regards the use of sprays, it is sometimes of value to direct five vigorous "bursts" of the agent into a graduated vessel, thus measuring the amount projected with each burst. It is sometimes as much as ½ ml. with some sprays, and free use of sprays will therefore readily result in an overdose.—I am, etc.,

Bristol. T. N. P. WILTON.

REFERENCE

[1] *Recent Advances in Anaesthesia and Analgesia*, 1944, p. 109. London.

SIR,—Mr. C. A. Jackson in his interesting paper on amethocaine hydrochloride (Jan. 15, p. 99) makes the following statement: "Application by means of a laryngeal spray should be avoided, as it may easily lead to overdosage." This statement should certainly be qualified, because the amount of solution delivered by a laryngeal spray can be measured, and the use of such a spray is to many the simplest method of anaesthetizing the pharynx and larynx.

The following procedure may be used to calibrate a de Vilbiss atomizer sufficiently accurately for practical purposes. An atomizer with a fine nozzle is chosen. Some of the solution to be used is placed in the spray. The number of complete compressions of the bulb necessary to atomize a measured amount of the solution can be found by directing the spray into a calibrated container. When this is known, it is possible in practice to count the compressions used while spraying the pharynx and larynx and thus to know what quantity of solution has been delivered. Two sources of error can arise. First, the bulb may not be fully compressed: this would lead only to less being delivered than estimated. Secondly, the amount delivered by the nozzle might vary over a period of time: this is easily checked.

From the above facts it may be seen that the use of a laryngeal spray need not lead to a risk of overdosage.—I am, etc.,

Bedford. N. WYNN-WILLIAMS.

SIR,—The article on severe toxic effects from amethocaine by Mr. C. A. Jackson (Jan. 15, p. 99) reminds me that I saw a similar case in 1938, in which convulsions followed the (traumatic) introduction of a bougie, 10 ml. of 2% amethocaine having been injected into the urethra. The convulsions were controlled by thiopentone; artificial respiration (by inflation with oxygen) had to be continued for 45 minutes before active respiration returned.

For bronchoscopy I prefer cocaine solution (10 or 15%) to amethocaine, and I believe that the danger of reaction is negligible provided that the drug is restricted to the air passages and be not swallowed or injected into the tissues. I think it likely that this applies to amethocaine also. Mr. Jackson's cases seem to bear this out: in the second it is stated that 2 ml. were thought to have been swallowed; in the first it is not stated whether the tracheal injection was made per glottidem or by external puncture. In the latter case it is comparatively easy to be misled as to the site of the needle, for air will be obtained on aspiration if the needle be ill-fitting, an injection into the tissues resulting. In the former case, solution falling on the walls of the upper part of the larynx may be brought up by a cough and swallowed. For this reason I always try to ensure that the solution be deposited well below the larynx: if per glottidem by a long catheter, if by external puncture by inserting the needle through the first or second ring of the trachea; injection at a higher point is made even more hazardous because the mucous membrane is separated from the cricothyroid membrane by areolar tissue, which increases the likelihood of injection into the tissues.—I am, etc.,

Newcastle-upon-Tyne. M. H. ARMSTRONG DAVISON.

SIR,—I was interested to read Mr. C. A. Jackson's article (Jan. 15, p. 99) on the above subject. I wish to record two recent experiences using amethocaine as a local anaesthetic in a cachectic patient.

The patient, an elderly woman with ascites following advanced malignant disease, required tapping at frequent intervals to relieve distension and discomfort. On the first two occasions, when amethocaine (4 ml. of a 2% solution) was used to augment a whiff of trilene, the patient became faint and giddy, and finally unconscious with a convulsive seizure. Consciousness returned after about five minutes. These seizures happened while the cannula was *in situ* and after the effect of the trilene had passed. Subsequent tappings using trilene only have been uneventful. It was only after the second time that I became suspicious and decided to use trilene only.

This case confirms Mr. Jackson's advice not to use amethocaine in a cachectic patient.—I am, etc.,

Lydbrook, Glos. M. MCMINN.

SIR,—Mr. C. A. Jackson in his article on the severe toxic effects of amethocaine hydrochloride (Jan. 15, p. 99) quotes me as having had two deaths from the use of this drug in gastroscopy. His reference is to the *Proceedings of the Royal Society of Medicine*, 1939, **32**, 538.

The reference is perfectly correct, but nowhere in the paper do I state that I had any deaths from the use of "decicaine" (amethocaine hydrochloride) in gastroscopy. I reported two deaths during the preparation for gastroscopy, one as having occurred in Minneapolis, the other in this country. I myself, in over 2,000 instrumentations, have had no fatalities with the use of this anaesthetic.

Later in his paper Mr. Jackson mentions that the addition of adrenaline reduces the toxicity of amethocaine hydrochloride by one-fifth. I should be very interested to know his authority for this, as the only experimental work that I have been able to trace goes to show that the toxicity of amethocaine and adrenaline when injected intravenously together is much in excess of either separately. For this reason I always advocate the use of 2% amethocaine hydrochloride solution alone.—I am, etc.,

London, W.1. P. E. THOMPSON HANCOCK.

SIR,—The two cases reported by Mr. C. A. Jackson (Jan. 15, p. 99) of toxic reactions following the administration of amethocaine hydrochloride prompt me to record experiences with this drug in children. For the last ten years 2% amethocaine hydrochloride (no adrenaline) has been used as a local analgesic for bronchography without toxic effects. Immediately after the insertion of a special needle through the cricothyroid membrane into the trachea the drug was slowly injected through the needle, the quantity, *one minim per year of age*, being carefully measured out and rarely exceeded. When the bronchial tree on both sides was to be outlined the dose of amethocaine hydrochloride was repeated between the filling of the first and the second sides. This second dose usually followed 10 to 20 minutes after the first, when the analgesic effect was wearing off. In about 1,000 bronchograms no ill effects that could be attributed to the drug have been observed.

These observations support Mr. Jackson's final remarks that overdosage or faulty technique is more often the cause of death than individual idiosyncrasy. Although adrenaline was not used in combination in our series, it is probably an extra precaution which should be taken in future.—I am, etc.,

London, W.C.1. C. ELAINE FIELD.

Treatment of Anuria

SIR,—I was interested to read Drs. D. A. K. Black and S. W. Stanbury's article on the treatment of anuria (Dec. 25, 1948, p. 1101). Their description of a case of anuria caused by incompatible blood transfusion prompts me to record briefly the following case in which anuria occurred during the course of blackwater fever and in which urinary flow was apparently established by intravenous glucose and plasma.

A British N.C.O., aged 31, was admitted to a military hospital in West Africa for subtertian malaria. Next day, whilst on quinine, he complained of abdominal discomfort, appeared shocked, and passed port-wine coloured urine. For the next five days his condition was satisfactory, and the urinary output was in proportion to the fluid intake. Anuria gradually started on the sixth day, and the total urinary output in 24 hours for the subsequent few days was as follows:

Day of Illness	*Urinary Output*
6th	3 oz. (85 ml.)
7th	1¼ oz. (35 ml.)
8th	Nil
9th	6 oz. (114 ml.)
10th	7¾ oz. (220 ml.)
11th	13½ oz. (380 ml.)
12th	39 oz. (1·2 litres)

During the sixth and seventh day of illness the patient showed signs of uraemia—viz., mental confusion, drowsiness, restlessness, muscular twitchings, and incessant vomiting. Blood pressure was 110/50, and blood urea 280 mg. per 100 ml. Attempts to establish urinary flow by alkalinization and hypertonic sodium sulphate solution failed. On the eighth day he became comatose, with Cheyne-Stokes breathing, and the so-called uraemic "frost" was visible on the skin. Urinary output was *nil*, and his blood urea rose to 300 mg. per 100 ml. His blood pressure remained unchanged. Blood count showed R.B.C.s 1.48 million per c.mm. and haemoglobin 38%. At this stage 20 ml. of 25% glucose solution was given intravenously, and an hour later he passed 2¼ oz. (78 ml.) of urine which was neutral in reaction and contained protein ++, urobilinogen +, bile pigments +, and urea 0.5 mg. Deposit showed epithelial, endothelial, and pus cells. No casts were seen. Encouraged by this result I decided to put him on glucose and plasma, and the following treatment was given:

Day of Illness	Total Glucose Solution (20–50 ml. at a time—every 3 to 4 hours)	Plasma
8th	100 ml. (60 ml. of 25% and 40 ml. of 50%)	2 pints (1·12 litres)
9th	220 ml. of 50%	2 " "
10th	220 ml. of 50%	2 " "
11th	190 ml. of 50%	2 " "

During the whole of the uraemic phase nothing was given by mouth and no intestinal lavage was attempted. Once the urinary flow was established the patient made an uneventful recovery, and apart from antimalarial therapy and haematinics no other treatment was given. Subsequent renal function tests were within normal limits.

On a physiological basis anuria can occur as a result of either one or more of the following factors: (*a*) renal circulatory failure; (*b*) renal excretory failure; and (*c*) renal secretory failure. I agree with Black and Stanbury that in lower-nephron-nephrosis anuria both the circulatory and the tubular factors enter into its pathogenesis. They wisely point out that in this type of anuria it is never possible to exclude the

possibility of spontaneous urinary flow, yet it would appear from my case that hypertonic glucose and plasma, either singly or together, did influence the establishment of the urinary flow at a very critical stage of illness, perhaps by affecting the renal circulation and nutrition and thus restoring its excretory and/or secretory function.

It is unscientific to draw any conclusions from one case, but as the combination of 50% glucose and plasma did appear to influence the course of the case at a very critical stage when other measures had failed I would recommend the above treatment in cases of anuria due to "renal anoxia" to elucidate its therapeutic value.—I am, etc.,

London, S.E.18. S. KARANI.

Allergy, Rheumatic Fever, and Nephritis

SIR,—The excellent summary of recent experimental research reported in the leading article "Allergy, Rheumatic Fever, and Nephritis" (Jan. 1, p. 21) seemingly strengthens the allergic aetiological hypothesis. Clinical facts deny the restriction of the antigen to the haemolytic streptococcus or its products. Even the late Professor Lichtwitz,[1] who largely influenced the revival of the allergic hypothesis, denied this specificity in the initial sensitizing infection (the pathfinder), or in recurrent excitant infections (detonating), whether of the acute or chronic type (septic foci which vary in degree but not in kind). The relationship of the sera of rheumatic patients to streptococci is non-specific.[2] May I suggest that such has an analogue in the proteus–rickettsial relationship?

Too many exceptions destroy the validity of any theory which ought to arise out of and be suggested by the facts. While the current knowledge of the concept of allergy is in itself hazy, there are many dark places in this particular application: in bacterial allergy there is a definite period of sensitization; multiplicity of antigens (already noted) is not characteristic of induced allergy; while the clinical allergies may be a sequel to infections or are aggravated by mild infections, they disappear during acute infections.[3] Rantz and his colleagues[4] confirmed the original observation of Swift that even during the latent period between the clinical onset of rheumatic fever and the excitant infection the rheumatic process is at work, as shown by the E.C.G., E.S.R., and leucocyte count. I have noted that finger-tip tenderness, an invaluable sign of rheumatic infection,[5] is present within a few hours of the onset of an excitant nasopharyngitis, itself resulting from contagion, so that the excitant mechanism, whether infectious or physical, such as chill, damp, or draughts, may be the same. Lichtwitz has argued that the almost instantaneous onset after physical excitants excluded the implication of micro-organisms. There is of course an analogue of epidemic coryza, a virus infection, and physical excitants.

As with the well-proven relationship of erythema nodosum or phlyctenular conjunctivitis to, say, tuberculosis, allergy would have been invoked, were the precise agent not known, to explain the coincidence of herpes simplex with excitant infections such as coryza, pneumococcal pneumonia, or malaria, with drugs such as organic arsenic, sulphonamides, or parenteral liver therapy, and with the normal alterations of the physiological cycle, as in recurrent menstrual herpes, which may be familial.[6] All these phenomena have their analogues in the natural history of rheumatic diseases—the relationship to adventitious infection (acute or chronic, "septic focus" type), to drugs, or to physical excitants, the predominance of women of the child-bearing age in the incidence of rheumatoid arthritis, and the effects of puberty on the rheumatic infection of childhood.

A virus aetiological hypothesis is suggested by the facts, although against it is the view that the primary histopathological lesion is in the intercellular ground substance; but this seems a moot point.[7] However, an allergic theory based solely on the haemolytic streptococcus is unsustainable.—I am, etc.,

Dublin. A. D. MCDWYER.

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1 *Pathology and Therapy of Rheumatic Fever*, 1944, pp. 24 and 32. London.
2 Wallis, A. D., *Amer. J. med. Sci.*, 1946, **212**, 713.
3 *Cecil's Textbook of Medicine*, 1943, pp. 469, 480, 486, 492. Philadelphia.
4 *Arch. intern. Med.*, 1947, **79**, 401.
5 *British Medical Journal*, 1947, **1**, 310; 1948, **2**, 768.
6 Van Rooyen, C. E., *et al.*, ibid., 1941, **2**, 298.
7 Fischer, A. G. T., *Lancet*, 1937, **1**, 1162.

Exo-erythrocytic Forms of Malaria Parasite

SIR,—We fully appreciate the fundamental discovery of the pre-erythrocytic stage of the parasite of human malaria by Drs. H. E. Shortt and P. C. C. Garnham, Sir Gordon Covell, and Mr. P. G. Shute (*B.M.J.*, 1948, **1**, 547). This discovery closes the gap between the anophelic cycle and the human cycle of the parasite's life. Shortt and Garnham's recent findings (*B.M.J.*, 1948, **1**, 192) of the persistence of an exo-erythrocytic cycle in *P. cynomolgi* even several months after the infection has started has strengthened the opinion, prevailing among malariologists for some years now, that persistence of the infection during the interval between the attacks of fever as well as the origin of relapses and the resistance to drugs in latent malaria are phenomena connected with the existence of exo-erythrocytic forms.

We cannot agree with the assumptions of this theory. We cannot accept the view that the perseverance of the infection is, as most observers believe, necessarily dependent upon the parallel persistence of plasmodial exo-erythrocytic forms. On the contrary, relapses are observed in individuals with latent malaria within an hour or two after strong emotion, shock, bomb explosion, cold baths, severe haemorrhage, surgical operations, etc., and this fact necessarily implies the existence of a developing endo-erythrocytic focus of parasites somewhere in the body of the individual. We are forced to assume that the endo-erythrocytic parasites have continued their focal life without ever passing into the general circulation.

Again, in individuals suffering from latent malaria, or rather focal malaria, a single injection of adrenaline intravenously is followed by the rapid emission into the peripheral circulation of endo-erythrocytic parasites in various stages of development. Such parasites are obviously originating from an endo-erythrocytic cycle and not from an exo-erythrocytic cycle. In the infection of fowls (*P. gallinaceum*) induced with infected blood a latent period follows the septicaemic phase, though sometimes this latent period is broken by minor relapses. In such hosts the exo-erythrocytic forms usually disappear towards the end of the second month. At the same time the infection is still active in the internal organs, particularly in the spleen and liver, with the presence of small numbers of endo-erythrocytic parasites and fresh granular pigment, probably originating locally, giving proof of the continuance of the schizogonic endo-erythrocytic cycle (D'Alessandro, Oddo, and Smiraglia).

In human *vivax* malaria induced by infected blood recurrences can occur, although less frequently as compared with infection with sporozoites. Analogously, according to Hawkins, Perry, and Thurston, a relapse may be provoked by splenectomy in monkeys with latent *P. cynomolgi* infection, but this occurs both when infection is induced by blood or by sporozoites.

Again, from the standpoint both of physiology and of pathology there is abundant evidence of the existence of a "focal" phase of the infection—that is, the existence of persistent morbigenous foci which maintain infection and disease long after the septicaemic phase has passed. Such foci, where endo-erythrocytic parasites can go on developing, are found in the splenic reservoirs of red blood corpuscles described by Barcroft and Binet, and are under the control of the spleno-contractile action of adrenaline. In the blood reservoirs, which are practically devoid of plasma, endo-erythrocytic parasites continue reproducing, protected by their position outside of the normal circulation from the action of antibodies and chemical substances. These facts explain the failure of attempts to eradicate the disease by means of chemical substances introduced into the circulation, because they never reach the parasites in the reservoirs of red blood corpuscles.

The above is only a short summary of the views expressed in my book, *Nuove Vedute sulla Malaria* (Rome, 1946), and by J. Radvan in *La Splénocontraction en Thérapeutique* (Bucharest, 1945).—I am, etc.,

Centro Siciliano di Malariologia, Palermo. MAURIZIO ASCOLI.

Infective Ear Disease

SIR,—I am indebted to Mr. T. A. Clarke (Jan. 15, p. 111) for his criticism of the methods of treatment of chronic suppurative otitis media in factory employees. I am in agreement with the principles on which he bases his method of treatment for the simple type of tubal infection or tympanic sepsis—namely, prevention of stagnation of the discharge and the reduction of the bacterial flora by dehydration and antibiotics. The choice of method used in the investigation reported in my paper was dictated by its applicability to the conditions of the factory surgery and because the results from its use were already

known by otologists. The results obtained in the factory surgery could thus be compared with those obtained elsewhere. It is not considered that other treatments are less efficient, and an assessment of treatment methods was not attempted.

As stated in the paper, the object of this part of the investigation was to determine the value of the factory clinics in treating ear diseases in the associated population. It would be helpful if one could compare the results of treatment obtained in the factory investigation with those obtained by the method Mr. Clarke advocates, if only because the latter requires less time spent on treatment. Tables I and II (taken from my full report to the M.R.C.) will, I trust, supply the additional information Mr. Clarke asks for.

TABLE I.—*Chronic Suppurative Otitis Media According to Position of Perforation*

	"Recurrent" Cases			"Continual" Cases		
	Central	Marginal	Superior	Central	Marginal	Superior
No. of ears seen ..	122	0	12	128	22	30
Percentage distribution	134 = 42·6%			180 = 57·6%		
Percentage distribution	91%	—	9%	71%	12%	17%
Average age at onset of first attack	13	—	16	17	14	18
No. of ears treated ..	102	—	11	111	20	21
No. of ears cured ..	83	—	9	60	7	14
Percentage cured ..	82%	—	82%	54%	35%	52%
No. of ears quiescent	5	—	—	9	3	2
Percentage quiescent	5%	—	—	8%	15%	7%
No. of ears failed ..	—	—	—	6	4	6
Percentage failed ..	—	—	—	5%	20%	22%

Table I shows that out of 19 ears rendered quiescent by treatment 14 had central perforations and only two had attic perforations.

TABLE II.—*Chronic Suppurative Otitis Media—Effect of Granulation Tissue on Results of Treatment*

	"Recurrent"		"Continual"	
	With Granulations	Without Granulations	With Granulations	Without Granulations
No. of ears seen ..	26	108	64	116
No. of ears treated ..	23	89	53	105
No. of ears cured ..	16	76	23	58
Percentage cured ..	70%	85%	43%	55%
No. of ears quiescent	2	3	2	12
Percentage quiescent ..	9%	3%	4%	11%
No. of ears failed and % failed	—	—	8 = 15%	8 = 7%

Table II shows that four ears, with granulation tissue present at the start of treatment, became quiescent. The perforation was central in the membrana tensa in three, the granulations arising from the tympanic membrane or meatal wall, and marginal in one, the granulations arising from the tympanic annulus. Before daily treatment was discontinued and the ear classified as quiescent the granulations had become healed by epithelization for several weeks. No case of obvious cholesteatoma was classified as quiescent.

With the present shortage of hospital facilities some grading of the severity of the cases is essential. It is due neither to over-tolerance nor dilatory decision, but to hard necessity, that cases of minimal infection are regarded as less urgently in need of surgical intervention than cases with profuse otorrhoea persisting despite conservative treatment. To advise operation for every case of quiescent ear disease is not possible in all treatment centres. Furthermore, it is unnecessary. Out of six quiescent ears treated in this investigation two had become dry six to eighteen months later (Table X of report). These results are corroborated by the examination of any series of cases of soundly healed middle-ear disease. A few will be found to have suffered an extensive destruction of the ossicles or the tympanic annulus from osteitis. The infection has obviously been overcome by natural resistance, possibly aided by conservative treatment.

Nevertheless it is agreed that persistent activity in a quiescent ear should be given the respect it deserves, and surgical intervention, which may in some cases be on the lines advocated by Mr. Clarke, will eventually have to be considered.—I am, etc.,

Birmingham. COLIN M. JOHNSTON.

SIR,—In his letter on infective ear disease (Jan. 15, p. 111) Mr. T. A. Clarke raises doubts as to whether regular daily treatment of chronic middle-ear suppuration is necessary. Also, in discussing Mr. Colin M. Johnston's advocacy (Dec. 18, 1948, p. 1049) of syringing the ear, he states that he knows "of no method more calculated to perpetuate infection: the easiest way to set up middle-ear discharge in a case with dry perforation is to syringe the ear."

No sensible person would syringe the ear with a dry perforation. The discussion surely centres round the treatment of active chronic middle-ear suppuration, and the subject is best approached by considering the fundamentals. Whatever method is used in treating the ear, so as to give the body's natural processes for overcoming the established infection the best chance of success it must be directed towards thorough cleansing of the ear to remove the usual foul discharge in which it lies bathed and to keep the ear as dry as possible. To achieve these ends we have the two principal schools, the advocates of the dry and the wet methods. The dry method consists essentially in thorough mopping of the ear, followed by removal of as much discharge as possible from the middle ear through the perforation by suction, then the insufflation of whatever powder the surgeon happens to favour. This form of treatment must of necessity be carried out by the otologist himself.

The wet method consists of thorough cleansing by washing out the ear with a drying agent; formaldehyde in the strength of 1 dr. (3.5 ml.) of 20% solution to a pint (568 ml.) of warm water has this effect. The meatus is then mopped dry. The latter method has the advantage that it can be carried out as a routine by a nurse with some training in ear work, and this is of immense practical importance in a large out-patient department. As regards the application of silver nitrate, this can be gratifyingly successful in cases where the granulations are purely superficial, but can have no lasting effect when they are indicative of deeper-seated bone disease.

To revert, then, to the question of frequency of treatment by either method, the rate of accumulation of discharge from a suppurating middle ear is usually such that any treatment applied less frequently than once daily must leave the ear bathed in pus for most of the time. If Mr. Clarke has been able to obtain good results from "treatment . . . perhaps once, perhaps repeated at weekly intervals three or four times," he must find the work of his out-patient department greatly relieved. My own experience has been disappointing in that I have not seen cases resolve under the dry method of treatment which had failed to do so after an adequate trial of the wet. In the light of the claims appearing from time to time for exceptional results from the dry method I have found on attendance at clinics where it is practised that there are as many cases of chronic suppuration attending as anywhere else. In addition, "free insufflation of powder largely filling the meatus," as Mr. Clarke describes, often leads to caking of the powder into a mass which may be hard to remove and must in some cases lead to damming up of discharge.

On the whole, then, I have found no advantage in results obtained by the dry method to offset the disadvantage that it requires the personal attention of the specialist, and that attention I hold to be necessary daily.—I am, etc.,

Glasgow. ALEX. R. HARPER.

SIR,—Mr. T. A. Clarke (Jan. 15, p. 111) questions the truth of the statement made in your leading article (Dec. 18, 1948, p. 1068). "It seems certain that regular daily treatment is the best method of cleaning up infected ears," and then proceeds to a very curious defence of his own views. His first plea is that "the evidence must be considered," but this is immediately followed by the dogmatic and unsupported statement that he knows of no method—referring to daily syringing *or* dry mopping and drops—more calculated to perpetuate infection.

This seems a very extravagant answer to the work of Banham,[1] who by the method of daily dry cleaning and light dusting with 2% iodine in boric acid powder obtained a dry ear in 82.5% of 200 cases of chronic suppurative otitis media occurring in R.A.F. personnel; and to the work of Mr. Colin M. Johnston (Dec. 18, 1948, p. 1049), who obtained 81.2% dry ears in a series of 316 cases by daily

syringing followed by spirit drops or a simple powder. Perpetuation in these cases was remarkable by its absence, and so far it would appear that the only evidence open to scientific consideration has been produced in support of the daily cleansing method.

Mr. Clarke submits that a result as good could have been obtained with far less treatment, but, whether or not figures are available in support of his contention, legitimate criticism can still be levelled at the treatment he advocates. First, if it is agreed that it is desirable to be able to assess the progress of treatment not only by the volume of the discharge from the meatus but by comparative inspections of the anatomy of the tympanic membrane and cavity, then it must be said that silver salts are most unsuitable local applications, as they discolour the whole picture and make qualitative observations very difficult if not impossible.

Secondly, Mr. Clarke states that his treatment (very careful toilet of the meatus, application of 20% silver nitrate, and the filling of the meatus with pulv. P.S.U.—sulphathiazole 10 parts, urea 1 part, penicillin 2,000 units per gramme—at weekly intervals), applied "perhaps once," will yield results equal to those obtained by Johnston. What one would like to know is whether criterion of cure is based on the middle ear being found dry after a dredging operation to remove all the powder, or on the fact that the powder has remained *in situ* and not been washed away by discharge. If the first is the case, how often does a syringe have to be employed to get the middle ear clean? And if the second, how long is the powder allowed to remain, with its obvious disadvantages of completely preventing subsequent inspection of the middle ear and of interfering with the hearing?

Thirdly, he states that such treatment—i.e., filling the meatus with sulphathiazole and penicillin power—is only with extreme rarity followed by skin reactions. To which one would ask, General or local reaction? Because it is not uncommon in hospital practice to find patients with a desquamating otitis externa, generally involving the drum, who have had penicillin in their meatus, either in drops or in a powder, prior to their visit.

Finally, to provide more of the evidence which Mr. Clarke regards as so essential before daily cleansing routines are adopted, results are given of treatment in the first hundred consecutive cases treated in the chronic ear clinic of St. Thomas's Hospital during 1948. The treatment consisted of meticulous dry mopping after suction of the middle ear with a Siegle's speculum, followed by light insufflation with 2% iodine in boric acid powder. The treatment was carried out daily wherever possible, a minimum of four attendances a week being the rule. The criterion of immediate cure was an absolutely dry middle ear. The results were as follows:

Number of patients treated	100
Number of immediate cures	73
Average length of treatment	12.4 days

Cases are not treated for long periods. Two weeks' adequate conservative treatment will suffice in the great majority of cases to make an accurate diagnosis, to cure those cases capable of cure by conservative treatment, and to convince the patient that all reasonable non-operative measures have been given a trial before operation is advised. Thus all cases referred for conservative treatment are reviewed at the end of two weeks' treatment, and in only a very small number is further conservative treatment advised.

I have to thank the staff of the E.N.T. Department of St. Thomas's Hospital for their permission to use the figures from that hospital.

—I am, etc.,

London, S.E.1. S. R. MAWSON.

REFERENCE

1 *J. Laryng.*, 1944, **58**, 117.

SIR,—The able letter from Mr. T. A. Clarke on this subject (Jan. 15, p. 111) raises points of the utmost importance to all otologists. Several papers read at the Royal Society of Medicine by Service members after the war gave remarkably good results from *daily* treatment of chronic otorrhoea. No doubt the treatment was carried out under the watchful eye of the otologist and not left to half-trained assistants. The conclusion is, I think, that daily treatment is a sound method of treatment only if efficiently carried out. As Mr. Clarke says, indiscriminate syringing is a positive danger.

It is a curious thing that treatment by zinc ionization is hardly ever done or even mentioned in aural departments. Conceived by Professor Leduc, of Nantes, and introduced to this country by Mr. Friel, zinc ionization is to my mind the greatest advance in the treatment of chronic otorrhoea during the past twenty-five years. Of course it is limited to certain cases. Ionization of an "attic" suppuration with a pinhole perforation is simply waste of time, but where there is an adequate perforation enabling the middle ear to be washed out with an attic cannula the results are often dramatic. The "toilet" of the ear and the ionization of course have to be done very thoroughly by the otologist and not just left to the electrotherapy department. Many cases, even those of many years' duration, clear up with one ionization. The saving of time in these cases is obvious. The neglect of this method of treatment is to be deplored and has been a matter of much regret to me. It is carried out with success in the L.C.C. clinics.—I am, etc.,

Guildford. T. B. JOBSON.

Treatment of Simple Ganglion

SIR,—It is most interesting to hear that Mr. G. H. Colt (Jan. 15, p. 113) and Mr. J. H. Kirkham (Jan. 15, p. 113) find, as I do, that the best treatment of a simple ganglion is simple pressure. I should like to thank Mr. John Hosford (Jan. 15, p. 112) for his kindly criticism of my letter (Jan. 1, p. 32), but I do not "rupture" the ganglion by pressure, but replace the jelly into the tendon sheath. On many occasions I have actually demonstrated to onlookers the jelly passing into the tendon sheath, and then moved the jelly about in the sheath.

I have, of course, followed up my cases and have found that the great majority do not recur. I am sorry Mr. Hosford has not had quite such good luck, and suggest as a reason that I probably see more "acute" or "traumatic" ones. One not infrequently sees them within a day or two of their occurring, and often within a week or two, and I think we shall agree that recent cases are more easily cured by pressure than old-standing ones in which the jelly has become harder.

I am aware that the modern teaching in the textbooks is that the majority of ganglia arise from joints, but I am afraid that I do not believe this. Mr. Hosford says in his letter that "the ganglion will be seen to arise from the capsule of a joint." Does he believe that a ganglion is formed by "mucoid" degeneration of the capsule of the joint or of a fibroma of the capsule? In the older textbooks it used to be taught that a ganglion was formed by mucoid degeneration of a tumour of a tendon sheath. I have never believed this, for I have seen hundreds of ganglia, but I have never seen one of these hypothetical tumours before degeneration has occurred.

The theory that a ganglion arises from the capsule of a joint is rather difficult to believe. Does a ganglion actually arise from the synovial membrane of a joint? One has seen many cysts containing synovial fluid arising from joints and many cysts containing jelly arising from tendon sheaths, but never has one seen cysts containing jelly arising from joints or cysts containing synovial fluid arising from tendon sheaths.

It is well known that small pockets and projections of the tendon sheath occur in some cases, which require some skill and patience in dissection, but has anyone ever proved that these pockets actually are continuous with the synovial membrane of the joint? Has anyone put a probe into the joint before the scalpel has got anywhere near? Has anyone demonstrated by the injection of a radio-opaque fluid that a ganglion does communicate with a joint? To-day a skilled orthopaedic colleague kindly allowed me to be present when he was dissecting out a ganglion over the wrist. At first sight it did appear as if there was a small hole in the base of the ganglion, but no probe could be passed into the joint and we agreed that in this particular case no communication existed.

We will all agree that many ganglia arise from tendon sheaths and have no connexion with joints—e.g., the pea-like bodies so commonly seen on palmar tendons. I have never seen a direct connexion between a ganglion and a joint, but I am willing to be convinced if someone will open up a ganglion and demonstrate a probe passing into the joint before the capsule of the joint is dissected. My opinion is that the textbooks are wrong: that the great majority of, if not all, ganglia are

diverticulae of tendon sheaths, and that the best treatment is simple replacement of the jelly by pressure, or, if this is impossible, dispersion of the jelly by pressure after insertion of a tenotome. Removal by dissection is seldom, if ever, necessary. I have not dissected a ganglion for three years, but have "dispersed" hundreds. To-day, in three seconds, I was able without great pressure to replace a ganglion on the back of the wrist in a girl of 12. She said it did not hurt at all. I have little doubt that I have cured it, but should she be one of the few unlucky ones that recur, the treatment will be "Rep. mist."

The point that needs clearing up is whether ganglia do in fact arise from joints, or whether this is a hypothesis produced to account for the unsatisfactory results of dissection of ganglia. May I, in conclusion, thank Mr. W. Sayle Creer for his letter (Jan. 15, p. 112) and very humbly suggest that his wonderment is indeed correct: "he and I are not living in the same world," psychologically.—I am, etc.,

Rotherham. ERIC COLDREY.

SIR,—I see a good many cases in the out-patient department of the local infirmary, and though I had gained an unenviable reputation as a champion ganglion-smasher with the family Bible and with thumb pressure I was not quite satisfied and evolved a simple technique.

I take a long, straight, sterile needle and, after painting the ganglion and the surrounding area with tincture of iodine, I push the needle along the diameter of the ganglion, puncturing it first at one end and then at the other and taking care that the needle does not puncture the skin at the opposite end. By pinching up the skin one can easily allow the needle to pass under the subcutaneous tissues at the opposite end. I then withdraw the needle to the centre of the ganglion and change the direction, pushing it first towards the proximal pole and then towards the distal—i.e., towards the S.E. and N.E. The ganglion is thus punctured in four places, or more if thought necessary. The needle is then withdrawn and the ganglion gently "kneaded," so that the glairy contents escape into the tissues. Finally, a wool pad and a strip of adhesive plaster is tightly applied. Recurrence by this method is rare. It takes only a couple of minutes and requires no anaesthetic.—I am, etc.,

Newtown, Waterford. A. J. D'ABREU.

SIR,—It was interesting to note that the old question of the best treatment for the common ganglion has again come to the fore. As the pathology is not known for certain, operative attack has always seemed to be unwise, because the chances of recurrence are by no means eliminated and the scar is at best disfiguring. If in addition to this disfigurement recurrence takes place the patient is going to be considerably worse off than before, and in addition sepsis is not unknown, which adds further to the disfigurement. The idea of banging the growth with the family Bible seems to be about as old as Queen Anne, the idea presumably being that the pliable nature of the binding of this book will enfold itself round the ganglion and so cause a complete rupture of the lining. In reality what seems to take place is merely a stellate fracture of the membrane, which again soon unites, with inevitable recurrence.

What I have found to be a most useful method of dealing with this common little lump is to infiltrate the skin with a few drops of 2% procaine. With the wrist firmly dorsi- or palmoflexed so as to render the utmost tenseness to the ganglion, the sharp point of the tenotome is then plunged in the side of the ganglion and carried right through to the other pole so as to completely transfix the membrane. With the point of entry of the tenotome acting as a fulcrum, the ganglion is incised first to the left, then turned and the same thing done on the other side. The effect of this is to liquidate the glairy fluid in the tissues, and following this a pad of lint or gauze is fixed firmly in position over the site of the ganglion. This is left for 48 hours, and when removed the ganglion has completely disappeared in the vast majority of cases. The whole treatment is painless, takes at the most 45 seconds, and causes no disability whatsoever. Should there be fear of transfixing a vein the procedure can be carried out under transillumination, and in any case the pressure deals immediately with any haemorrhage.—I am, etc.,

High Wycombe, Bucks. R. A. KILGOUR WIENER.

The Dangers of Heroin

SIR,—Your annotation (Jan. 15, p. 107) on the dangers of heroin was interesting, but many will disagree with the view that there is a case for the total abolition of this valuable drug at any rate in a country like our own where drug addiction, thanks to the vigilance of the Home Office, is no serious problem.

Compared with morphine and other opium derivatives heroin has two outstanding advantages: it is a much more potent analgesic, and it produces a much higher degree of euphoria. In both these respects it is unrivalled by any other drug. It has, however, the great disadvantage that it is the most potent drug of addiction known. This, it is important to realize, is due to its specific chemical structure and not to its euphorigenic properties.

The unique properties of heroin make it the drug of choice, in my opinion, as an analgesic during labour, and I have written on its use in this connexion on previous occasions.[1,2] In your annotation you state that "since 1931 the profession has been deprived of heroin in some 26 countries without evident disadvantage." May I point out that more than one famous obstetrician in the United States has lamented the fact that heroin cannot be legally dispensed there?[3,4]

For intravenous use there is no doubt that heroin is safer than morphine. Although many thousands of injections of morphine must have been given intravenously without incident, occasionally a vasomotor reaction occurs, and on one occasion, in a patient already suffering from left heart failure, I have seen intravenous morphine (which was given very slowly) precipitate cardiovascular collapse. This property of morphine has been confirmed by experimental work on animals.[5] Heroin is free from this danger.

You mention dihydromorphinone as a substitute for heroin. Although dihydromorphinone is a most valuable drug, especially where an opiate has to be given frequently to a person in whom it is important to avoid the production of addiction, I have not found it to be such a potent analgesic as heroin. Furthermore, the absence of euphoria constitutes a distinct disadvantage in obstetric work and in the treatment of the terminal stages of diseases such as cancer. You make mention of the use of heroin in cough mixtures. There can be no doubt that its use in this respect for trivial conditions, which is quite widespread, is unjustifiable.

There is unfortunately widespread ignorance amongst the profession as to the nature of the addiction syndrome. So many regard it as due to mere psychological dependence, whereas it is really due to a complete upset of the whole chemistry of the nervous system. Unfortunately opium derivatives are often withheld unjustifiably from patients owing to the fact that many doctors have only a vague and flimsy knowledge of addiction. Statistics reveal that in this country it is the profession and not the public who stand in most danger of addiction and who suffer the heaviest casualties, and a case could be made out for better teaching on this subject in our universities. Finally, it should be remembered that most drug addicts are in the first instance people who have a psychopathic make-up.[6]—I am, etc.,

Carlisle. JAMES ROSS.

REFERENCES

1 *British Medical Journal*, 1944, **1**, 59.
2 Ibid., 1947, **1**, 738.
3 Williams, J. W., *Obstetrics*, 1945. New York.
4 Beckman, H., *Treatment in General Practice*, 1948. Philadelphia.
5 Krueger, H. M., Eddy, N. B., and Sumwalt, M., *Publ. Hlth Rep., Wash.*, 1941, Suppl. 165.
6 *Report of the Departmental Committee on Morphine and Heroin Addiction*, 1926. London: H.M.S.O.

Sensitivity to Penicillin

SIR,—The following report of a case of extreme sensitivity to penicillin may be of interest because of the rapid onset of symptoms and the small dose of penicillin used.

The patient, a woman aged 45, was referred to me for the removal of an unerupted upper left canine tooth lying in her palate. She was otherwise edentulous. In accordance with my usual routine the patient was given 100,000 units of penicillin in 1 ml. of sterile distilled water intramuscularly. This was injected five minutes before operation at 10.45 a.m. on Oct. 22, 1948, as a prophylactic against transient bacteriaemia which might be set up by surgical interference. Under local anaesthesia a palatal flap was then reflected, overlying bone removed, and the tooth extracted. The wound was sutured, a gauze drain inserted, and the patient sent home at 11.30 a.m.

At 1.15 p.m. there was an urgent call from the patient's companion. Fifteen minutes earlier the patient had a rapidly spreading urticarial reaction. It commenced with puffing of the eyelids, deafness, and pain

in the left ear. She became delirious and had difficulty in breathing. When seen at 1.30 p.m. the acute attack was rapidly diminishing and the patient was relatively coherent, so the foregoing history was obtainable. Examination showed typical urticarial weals all over the body, but particularly on the neck and the flexor surfaces of the arms. The face was very swollen in both infraorbital regions, and the eyelids oedematous and almost closed. The deafness was quite severe and it was necessary to shout.

A diagnosis of penicillin sensitivity was made, and in view of the severity of the symptoms a medical colleague was called in consultation, when "benadryl," 50 mg. four-hourly, was prescribed. By evening the patient was much brighter, eyelids less swollen, and skin eruptions reduced; the dyspnoea, presumably due to oedema of the glottis, and the deafness, due to catarrhal blocking of the eustachian tube, were still present. All symptoms, however, had gone by the second post-operative day. At no time was there the slightest pain, swelling, or any other ill effect in the operative area. It was subsequently discovered that the patient's family physician had noticed that any injections which he had had to give her from time to time always left a red weal at the site of the injection, but she had not thought it important enough to mention.

Aseptic precautions were observed throughout, and the penicillin used was the crystalline variety put up by one of the best-known firms. The local anaesthetic has been used for some considerable time and has never produced any reactions, and, in any case, in my experience a hypersensitivity to local anaesthetics or their adrenaline content usually produces its reaction in less than five minutes after injection. No such condition was encountered in this case, and it is felt that it is a true hypersensitivity to penicillin. I am grateful to Dr. Norman Jackson for his help in confirming the diagnosis and treatment.

—I am, etc.,

Dublin. ADRIAN COWAN.

Physiotherapy

SIR,—The Council of the Chartered Society of Physiotherapy has read with great interest the annotation on physiotherapy (Dec. 25, 1948, p. 1114). The Society welcomes the support of your *Journal* in stressing the importance of strict adherence by chartered physiotherapists to their ethical by-laws and also in reminding the medical profession of the assistance they can and should give in this matter.

The Council feels that an amplification of one aspect of the annotation might be helpful, as some members of the medical profession may not have been aware of the Society's intention in introducing a question into the final examination which can be construed as requiring physiotherapists to "prescribe" treatment. Candidates are required to demonstrate methods of treatment which may be applied in certain conditions, and the purpose of the question in this form is merely to give candidates the opportunity of demonstrating methods of treatment which they are accustomed to using.

The medical profession can be assured of the desire on the part of the Chartered Society to secure that closer co-ordination of medicine and physiotherapy to which the writer of the annotation refers, and it is hoped that concrete proposals will result from this suggestion.—I am, etc.,

W. S. C. COPEMAN,
Chairman of Council,
London, W.C.1. Chartered Society of Physiotherapy.

Continuing Streptococcal Disease

SIR,—I was very much interested in the leading article (Jan. 22, p. 144) under the heading of "Continuing Streptococcal Disease." I have for the past twenty years been engaged both clinically and experimentally on the subject of chronic streptococcal infection as a disease entity, and have described this condition as "the pre-rheumatic state" in various publications since 1932. I feel that this is in fact a better term than that of "post-streptococcal state" as postulated in the article in question.

There is one point which to my mind is important, and which does not appear to have received due attention—namely that those who have become victims of "continuing streptococcal disease" following upon acute streptococcal infection were already previously "streptococcus-prone," if one may use this term to denote a subnormal resistance to streptococcal infection, as a close examination of their previous medical and family history will show.

There is accumulating evidence to suggest that the "streptococcus-prone" individual has a constitutional and hereditary tendency as much as, if not more so than, the tuberculous subject. Recognition of the streptococcal subject in the early and pre-sensitization stages enables adequate protection to be given by careful immunotherapy from the disasters which are liable to follow upon sensitization by acute attack.—I am, etc.,

London, W.1. J. D. HINDLEY-SMITH.

Cough Fracture of Ribs

SIR,—The interesting papers on this subject in the *Journal* of Jan. 22 bring to notice a condition which, though no doubt rare, probably occurs far more frequently than is generally supposed. This is, in fact, Dr. Raymond C. Cohen's view (p. 133). The reason that the fracture is overlooked is that both radiologist and physician miss the ribs for the lungs. This fact and the suggestive symptom of something "giving," which was mentioned by Dr. J. W. Paulley and his colleagues (p. 135), were illustrated by a case seen recently.

A male chronic bronchitic, aged 59, felt something "go" in the back of his right chest at the end of a bout of coughing. Persistent pain was aggravated by breathing. It was intense for three weeks and bearable thereafter. I saw him four months after the onset: even then he dare not sneeze or blow his nose without "hugging his ribs." Apart from signs of bronchitis and emphysema he also exhibited exquisite tenderness over the sixth and seventh right ribs posteriorly. The first *x* ray taken soon after the onset of pain showed, though faintly, a fracture of the fourth right rib. A further picture taken four months later revealed also a break of the 6th, 7th, and 8th ribs. Full recovery followed control of the cough by codeine and of the chest movement by strapping.

—I am, etc.,

London, W.1. A. H. DOUTHWAITE.

Cough Fracture in Late Pregnancy

SIR,—I was most interested in the article by Drs. J. W. Paulley, D. H. Lees, and A. C. Pearson on the above subject (Jan. 22, p. 135), as it brought to mind a case of mine about twenty years ago when I was in practice near Liverpool. As I have no notes on the case I must rely on memory.

A multipara (one), in her late twenties, had engaged me for her confinement, but at about the eighth month contracted whooping-cough, presumably from her own child, who was suffering from the same complaint. I was called to her in the early hours of the morning, to find her complaining of severe pain in the left side of the chest following a bout of coughing when in bed. I found that two ribs were fractured (? eighth and ninth), but the patient was emphatic that the two did not fracture at the same time, but that she felt the second one crack with a subsequent bout of coughing about twenty minutes after the first. I had her admitted to Walton Hospital, where she made an uneventful recovery and had, I believe, a normal delivery at full term. Her history previous to this was good, and she had no chronic chest condition. I attended her and her family for several years after this, but she never complained of her old injury or had any pulmonary complications.

—I am, etc.,

Menai Bridge, Anglesey. F. A. EVANS.

Dystocia after Amputation of Cervix

SIR,—I read Mr. Walter Calvert's memorandum on dystocia after amputation of the cervix with very great interest. As an obstetric house-surgeon I had a case which has taught me to treat pregnancy following colporrhaphy with very great respect. I cannot give full details now as the records are no longer available to me, but here are the main facts for what they are worth.

In the early afternoon a woman aged about 40 was admitted in advanced first stage of labour on account of a transverse lie. On examination the membranes were found ruptured, the cervix half dilated and rather tense, and the right shoulder presenting. The consultant obstetrician was immediately summoned, and an internal version was performed by him under deep anaesthesia. I was instructed to ease the labour with pethidine and to conduct the delivery personally. Three or four hours later the breech reached the perineum, and all went well until the shoulder-blades appeared, when progress ceased.

On examination, a thin, tight, unyielding rim of "cervix" was found to be gripping the baby just below the shoulders and both arms were extended. Rotating the body made it possible to draw down one arm, but the other remained out of reach despite this manœuvre. Realizing that every second counted now, increasing

pressure was applied over the shoulder in an effort to push the arm forward within reach. When hope had almost been given up, the shoulder flopped forward with a snap, and then the arm was drawn down with difficulty. The head was then delivered by suprapubic pressure and a very gently applied Mauriceau-Smellie-Veit grip. The baby, though badly shocked, revived after a few minutes following the administration of lobeline and O_2/CO_2 mixture. Subsequent *x*-ray examination of the child's shoulder showed a fracture about the middle of the clavicle, which fortunately united satisfactorily.

Questioning the patient afterwards revealed that since the birth of her last child some ten years previously a simple colporrhaphy had been performed for prolapse, and when this failed to cure the condition a Fothergill operation with radical amputation of the cervix had then been done. Unfortunately, and for obvious reasons, this history was not obtained before delivery. Examination on the tenth day showed almost complete absence of the vaginal portion of the cervix, it being replaced by a small hole on the anterior wall of a rather narrow vault.

I hope that this will serve to show how easily one can be caught out by this unpleasant complication and to warn against too hasty amputation of the cervix in women of childbearing age.—I am, etc.

Acharacle, Argyll. ROBERT S. C. FERGUSSON.

Cervical Stenosis after Forceps Delivery

SIR,—Mr. Walter Calvert's memorandum on dystocia after amputation of the cervix (Jan. 8, p. 58) interested me because I have recently dealt with a similar case following previous forceps delivery.

The patient was aged 41 and had had three labours, the last of which ended in forceps extraction six years previously. Each of the babies weighed between seven and eight pounds. When seen by me in April, 1948, the patient was twenty weeks pregnant, and routine examination disclosed gross scarring of the upper vagina, the cervix being unrecognizable. There had been threats of abortion at the 12th and 15th weeks. It was hoped that this scar tissue would relax at labour, but she was booked to have her confinement in King Edward VII Hospital, Windsor, the possibility of delivery by caesarean section having been considered. Spontaneous labour started at term on Sept. 3, and when I was called I found her to be bearing down strongly and what at first appeared to be the foetal head distending the perineum. On closer examination this was found to be the thinned lower uterine segment covering the head, and no os was visible or palpable.

Lower-segment caesarean section was at once performed and a living child extracted. Again no suggestion of a cervical canal could be identified from above, but since she had menstruated, conceived, and had had two threats of abortion during the pregnancy it was decided to wait and see whether lochia could be passed. On Sept. 7, three and a half days after operation, the patient had passed no lochia at all, and the centre of the lower uterine segment was therefore incised and a catheter stitched in. About 2 oz. (57 ml.) of thin, non-offensive, blood-stained fluid issued from the uterus. On Oct. 25 the patient attended the post-natal clinic. There was slight blood-stained discharge from the uterus, the latter being of normal size, and per speculum a very small aperture was seen at the upper end of the vagina.

It would appear that the previous forceps delivery had resulted in severe laceration, if not avulsion of the cervix, with resultant stenosis.

—I am, etc.,

Windsor, Berks. F. H. FINLAISON.

Neonatal Asphyxia

SIR,—Dr. W. N. Leak (Dec. 18, 1948, p. 1079) remarks, "I would only add that experience with caesarean babies is not quite applicable to normal births. For some reason caesarean babies are much more liable than others to die rather quickly and inexplicably."

My experience in general practice has also been that babies born from caesarean section do not breathe as spontaneously or as quickly as those delivered through the birth canal, and, furthermore, I believe that caesarean sections performed on patients in labour produce better-breathing infants than those cases where the operation is performed before labour has set in. These phenomena can be satisfactorily explained if we accept the actuality of foetal respiratory movements. Evidence to this effect has come from three sources: clinical observation, the presence of the contents of amniotic fluid in the lungs of infants at necropsy, and the presence of amniotic fluid itself in foetal lungs as demonstrated by the injection of contrast materials into the amniotic sac.[1]

An experiment performed by myself last year confirmed Davis and Potter's observations. The possibility that anaesthesia and/or operative interference may account for the presence of contrast material in the lungs was completely eliminated in my experiment by the demonstration of its presence in the lungs of the intact foetus *before* hysterotomy. If, therefore, we accept the aspiration of amniotic contents by the foetus as a fact, we may account for the above phenomena of the caesarean baby. Two theories, a chemical and a mechanical one, suggest themselves to the writer. During the normal process of labour the placental circulation is disturbed, with a resultant condition of asphyxia, which sensitizes the foetal respiratory centre and prepares it for the onset of extrauterine respiration. Secondly, the process of labour, by squeezing the liquor amnii out of the foetal lung, prepares it for the extrauterine substitution of air for fluid.

The caesarean baby is denied both these beneficial effects of normal labour. Its lungs at delivery are still full, or partially full, of fluid, and its respiratory centre has not been sensitized; very often this infant is truly "drowned," and unless adequate measures are promptly taken it will succumb—hence the comparatively high death rate and incidence of respiration pneumonia in infants delivered by caesarean section.

The lesson then is that in all caesarean sections it should be a routine procedure to do intratracheal catheterization as soon as the infant is delivered.—I am, etc.,

Benoni, South Africa. E. JOOSTE.

REFERENCE

[1] Davis, M. E., and Potter, E. L., *J. Amer. med. Ass.*, 1946, **131**, 1194.

Classical Caesarean Section

SIR,—I would like to confirm the opinion expressed by Mr. Percy Malpas (Jan. 22, p. 156) that the lower-segment operation cannot always replace the classical operation.

Recently I had two similar cases, when the classical operation was a blessing and not an abomination. Both were elderly primigravidae, and each had a fibroid (the size of a foetal head) in the anterior wall of the lower segment. To do a lower-segment operation in these cases would have necessitated cutting through the fibroid. Such a procedure would undoubtedly have increased the risk of operative haemorrhage, post-partum infection, pulmonary embolus, etc. I was very glad to be able to turn around and do a classical section with no difficulty and much less risk.

—I am, etc.,

Sheffield. TIM BOLAND.

Death at Birth

SIR,—The annotation entitled "Death at Birth" (Jan. 8, p. 64) stresses the need for more accurate information and certification of the causes of neonatal death. It seems important to draw attention to the fact that practitioners are often discouraged from the scientific approach to the problem and use of terminology taught them as students because of the legal problems involved.

In the terminology of the Medical Research Council's classification of disease,[1] two of the most frequent causes of neonatal death are (751) intracranial injury at birth, and (753) asphyxia during or after birth, yet if either of these is stated on a death certificate it is refused by the local registrar of deaths and an inquest frequently ordered by the coroner. In my experience several scientifically minded practitioners and resident medical officers have performed post mortems on infants born under normal conditions in maternity homes, and, on certifying the cause of death as intracranial haemorrhage due to tentorial tear or other type of trauma, have found themselves in the coroner's court. They can hardly be blamed if on future occasions, in order to save parents further distress or themselves frequent attendance in the court, they retreat willingly to the vague but safer use of the terms "atelectasis" or "prematurity."

In this country many large teaching maternity departments can produce annual statistics compiled by their obstetric and paediatric registrars in which an attempt is made to state an accurate diagnosis. There is often a marked discrepancy between these statistics for neonatal deaths and those given in the annual reports of the medical officer of health for the particular area involved, particularly as regards the use of the term "prematurity" as a primary cause of death.

If any encouragement is to be given to greater accuracy of certification or the more frequent performance of post-mortem examinations on the newly born, it is essential that these legal difficulties should be overcome as soon as possible.—I am, etc.,

Bristol. BERYL D. CORNER.

REFERENCE

1 *Spec. Rep. Ser. med. Res. Coun. Lond.*, 1944, No. 2'8. H.M.S.O.

Millilitres Correct

SIR,—Dr. J. M. Hamill (Jan. 8, p. 72) revives and reinforces suggestions that have been put forward and made official in more than one edition of the *British Pharmacopoeia*. The *B.P.* 1932 suggested, too, the use of the word "mil" as a short designation for millilitre. That these suggestions have met with little response among those who use and make drugs indicates the strength of habit and shows how few read and act upon the recommendations made in succeeding prefaces to the *B.P.*

Thinking, perhaps, to get round it in another way, the *B.P.* 1948 has discarded the word mil and adopted the abbreviation ml. for millilitre. This seems rather a pity and somewhat defeatist, for mil is a good word and can be both an abbreviation and a word in its own right. Mil is short, to the point, indicative of the word from which it springs, and, printed or spoken, not to be confused with any other measure (which is more than can be said for millilitre). From a typographical point of view, the abbreviation ml. is undesirable, for it will often intrude an ugly and distracting point into running matter without saving type-space and, by encouraging the spoken use of millilitre, will invite typists and compositors to spell the word in full rather than use the abbreviation where that has been intended by the author or editor.

May I put in a plea for "mil," and hope that the next edition of the *B.P.* will revert to its use, having noted that since 1949 physicians, manufacturers, and pharmacists have come to adopt it?—I am, etc.,

Liverpool. N. A. HERDMAN.

The End of Compulsory Vaccination

SIR,—The end of "compulsory" vaccination as of July 5, 1948, marked a red-letter day in England singularly well timed in its proximity to July 4 and to the bi-centennial birth date of Edward Jenner, who was born on May 17, 1749. This end to compulsory vaccination in England has intensified my desire to contribute a letter to the *British Medical Journal* as further suggestion for more careful discrimination in the process of vaccination.

Professor Major Greenwood (July 3, 1948, p. 23) has shown how the zeal of propagandism may overcome scientific facts, an example of which has recently been demonstrated in New York, where only twelve cases of smallpox were reported in a population of 5,000,000 people vaccinated within two weeks of the appearance of the first case. Coincidentally there were approximately 2,500,000 people daily in the city who must not have been vaccinated and in which group no case of smallpox developed. (It is estimated that the daily population of New York City is 7,500,000.) The incidence, therefore, of smallpox was much lower in the non-vaccinated group than in the vaccinated group. It is of interest to note that in the twelve reported cases of smallpox ten were convalescing from some acute infectious disease and an eleventh patient was pregnant. Experimental studies have shown that "where an animal is recovering from an acute stage of a disease, the absorption of an additional amount of antigen introduced through further injection may precipitate a new state of the disease and be responsible for aggravations."

At this most opportune time I would like to make a few random observations to promote some thought upon vaccination. In the outbreak of smallpox in New York City it has been stated that many people who became ill with one of a variety of illnesses several days after they were vaccinated called the health department to find out if the vaccination was responsible. Since in New York City there are 1,000 people ill daily, and since practically everyone in New York City was vaccinated, it was inevitable that some of these people would become ill and die. Vaccination does not stop the normal course of events, and vaccination should not be blamed for cerebral deaths, haemorrhages, etc.

These claims or "discredits" can best be answered by quoting Hans Zinzer, who states, "It is advisable to examine the reports of cases observed during epidemics, when doctors are expecting them and are more likely to scrutinize all obscure conditions with the disease in mind." Hans Zinzer was neither heard nor remembered in New York City because his admonitions were drowned out by worthless statistics and medical tradition, whereas efforts were made to excuse post-vaccinial reactions on the basis of people dying daily in New York City of normal causes.

I wish, therefore, to offer one single suggestion upon this red-letter day—namely, that we do not vaccinate when there is present a possible acute infectious disease. As you may have already surmised, the media of your distant channels has caused much more native littoral reverberation than have my own local efforts, and it is for this reason that I am desirous of writing to your *Journal*.—I am, etc.,

Newark, New Jersey. EMANUEL ROSEN.

A Clinic under the N.H.S.

SIR,—Those of your readers who are interested in the development of the new Health Service may find food for thought in the following example of how it affects clinic work. The I.S.T.D. (Institute for the Scientific Treatment of Delinquency) was established 16 years ago as a unique experiment. It was supported by voluntary contributions and the directors and the medical staff gave their time free. Although handicapped by lack of money and staff, it nevertheless succeeded in treating a considerable number of patients, carrying out scientific research, arranging lecture courses, and so established an international reputation for this pioneer work.

The psychiatric treatment of criminals and psychopaths is as yet in its infancy. Patients whose main trouble is their inability to fit in with accepted social codes are not likely to fit in with accepted methods of psychotherapy, to attend regularly, to tell the truth, and to co-operate. Convinced that if a patient is unable to fit himself to a therapy the therapy must fit itself to the patient, I have worked out a method of seeing these criminal patients at my private consulting-room whenever they find themselves in an emergency, helping them in their practical difficulties, giving them if necessary food or money, establishing personal contact, and doing psychotherapy whenever the patient is ready for it. With this very unconventional method I find it is possible to get results in a number of otherwise intractable cases.

The old I.S.T.D. gave me every latitude and encouragement to experiment. Since July 5, however, its clinic has been nationalized, and I have been informed that all treatment must be carried out on the premises of the clinic in my allotted time; also that not only would I not be paid for the time I spent with my old I.S.T.D. patients if I continued to see them in private because they could not attend in clinic time, but that they would be struck off the clinic list. On the other hand I would be paid only for the time actually spent in the clinic building, even though, most of the time, there were not enough patients to keep me busy. The Government, so I was informed, is paying us for time, not for skill, and as far as I know I was the only psychiatrist who objected to getting paid for sitting unoccupied in the clinic premises.

As I had been intimately connected with the I.S.T.D. for 16 years I tried to accommodate myself to what I regarded as a stupid situation made worse by the attitude of the clerical staff, who soon developed the Civil Service manner. But when the appointment clerk refused to allow me to see three more patients in my allotted time, informing me that it was she who fixed my appointments and decided whom I was going to see and for how long, I had no alternative to immediate resignation.

Already the Ministry has spent money freely on salaries and clerical assistance and is likely to spend more in the near future. The clinic is likely to get a bigger and up-to-date building, a larger medical and a still larger clerical staff. No doubt the Government will soon have a "showplace" run with "efficiency"; the doctors who are accommodating enough to fit in will get easy money and easy work; patients who are not too ill to fit in will get treatment. Nevertheless, the scientific standing of the clinic will decline, both because there is no scope for elasticity and research and because conditions are not likely to attract the best doctors.

The cost of treatment per patient is already immensely greater than it was in pre-nationalization days and even higher than in ordinary private psychiatric practice; and it is likely to become still more expensive. The cost of "productive" interviews cannot be computed. All treatment that does not result in ultimate improvement is a waste of the taxpayer's money. Employing doctors who are new to this branch of medicine and have no scope to experiment is not likely to improve therapeutic results. This also rules out the treatment of difficult patients, psychopaths, and criminals who are most in need of it. England to-day is ready to tackle the problem of crime in an up-to-date and humane manner, but it does not bode well when we find that what used to be the most advanced clinic of its kind is restricted in its development by such short-sighted and petti-fogging regulations,—I am, etc.,

London, N.W.1. MELITTA SCHMIDEBERG.

Medical Books in India

SIR,—There are a number of valuable old medical books, printed in various countries of Europe in the 18th and 19th centuries, lying unknown and unutilized in India and gradually disappearing or disintegrating.

The Government of India have recently approved of a scheme to search for, salvage, and examine the old medical books in various libraries in India with a view to preparing a special catalogue of these valuable books. Circulars have been sent to all the medical colleges and other medical institutions in India requesting lists of such old books for detailed examination. Some of the books will have to be photographed to show the title pages or illustrations. An analysis of the contents and the importance of the books as well as biographical notes of the author will have to be added.

Special attention has to be given to old medical books dealing with the health problems and diseases of India and neighbouring countries, and also to those books written by various medical men serving in India, either as East India Company's doctors or as surgeons attached to native States or private missions.

Some of these books have been printed in India and may not be available easily in western countries and libraries. Their existence or contents are unknown to European and American teachers and writers on medicine. Even in India all the books printed in India on diseases of India in the eighteenth and nineteenth centuries are generally unknown to the Indian medical profession. When somebody knows about the existence of an old medical book, it is not available in certain parts of India. There is no list of such old books, and whether they are available in India and if so where.

May I request your readers to pass on any information they have regarding the existence of old medical books, particularly those printed in India, or manuscripts in any private collection or in the private libraries of the medical practitioners of the last century? Many of the private libraries of the native States, *zamindars*, educated and cultured families, missionary establishments and various printing presses and publishing houses may have a few valuable old medical books which may not be available in the public or medical college libraries. All lists of such books or the addresses of persons where such books are available, or even the books themselves, may be sent to the undersigned.—I am, etc.,

Madras Medical College, Park Town, Madras. D. V. S. REDDY, Officer on Special Duty for Reorganization of Medical Libraries in India.

Pulheems

SIR,—The article on Pulheems by Major R. T. Fletcher (Jan. 15, p. 83) and your own leading article (p. 105) have stimulated me to describe some of the shortcomings of this system as they appear to the unit medical officer who has to do so many of these examinations. My first attack is directed against the principle which is hidden in this system—that a man should only be employed in work for which he is allegedly judged fit by some medical man or board. Is this a new control, a new form of direction? I consider it unjustified in civil life. In Service life surely it would be more valuable to fit the man's duty to his previous occupation—an arrangement which occurs very infrequently.

Secondly, the system itself is far too complicated to carry out. The examination, as in the official instructions, requires a medical board with numerous nurses and, most important of all, at least thirty to forty-five minutes per man. The documentation is complex and means nothing to a non-medical man and equally nothing to any doctor who has not had considerable experience of the application of Pulheems. By far the most important snag, however, is the amount of time required for a full Pulheems and the insistence on yearly repetition.

Thirdly, I come to the difficulties and disadvantages in practice. The actual time that a unit medical officer can spare for Pulheems would be found to be about five minutes per man. This results in simple substitution of P2 for category i, P3 for category ii, P7 for category iii—the only real step forward being the pulmograph, which cannot always be done. In addition, until the advent of the "standard doctor" opinions will vary on any given case. A system of classification so rigid and compartmented as Pulheems emphasizes these differences and will cause confusion. Furthermore, mental capacity and emotional stability cannot be assessed in five or thirty-five minutes.

My final criticism is directed at Major Fletcher's remarks on various points arising from the application of Pulheems. He states that not enough emphasis is placed on teaching the recognition of the normal in the medical curriculum. What is the purpose of the preclinical and early clinical training if not to emphasize this very aspect? His statement is one that is easily made but difficult to prove or disprove; it certainly cannot be accepted as a fact *per se*. To add the teaching of a medical classification system to the medical student's burden is heaping an unnecessary straw on the camel's back.

I must admit to being baffled by the meaning of the following statement made by Major Fletcher when speaking of Pulheems. He says: "It goes a long way towards unifying and rationalizing our standards and towards improving our clinical appreciation of physical and mental health." Perhaps Major Fletcher could elucidate this.

In conclusion I should like to suggest an alternative which might be more workable: A strict Pulheems on entry by a board; yearly certification of no change by the unit M.O. accompanied by a five-minute examination and pulmograph; any permanent alteration to be made by a board or at a hospital, temporary alteration to be made by the unit M.O.—the most important point being the fact that the unit M.O. is not expected to do a strict Pulheems.—I am, etc.,

SURGEON-LIEUTENANT.

Anaesthetic Explosions

SIR,—With reference to your "Medico-Legal Notes" in the issue of Jan. 15 (p. 117), I should like to state that the explosion in the Southend-on-Sea Hospital was due to static electricity and that no diathermy, cautery, or electrical apparatus was used throughout the whole operation.—I am, etc.,

Southend-on-Sea. N. AIDAN VINCENT, Resident Anaesthetist.

POINTS FROM LETTERS

Spinal Analgesia for Caesarean Section

Dr. JOHN HALE POWER (Coventry) writes: Surely recent letters on the subject of spinal anaesthesia and caesarean section are rather missing the obvious point. The collapse which does occasionally occur is not due, in my opinion, to any vasodilatation of the uterus. Caesarean sections under spinal anaesthesia are not notable for their "bloodiness," but rather to the fact that any abdominal tumour interferes with diaphragmatic respiration. When the intercostals are knocked out by the spinal, collapse follows.

The Annual Proceedings 1944–47 has been issued by the Medical Officers of Schools Association, 11, Chandos Street, Cavendish Square, London, W.1. It includes a number of papers on school medicine read to the Association. Sir Adolphe Abrahams discusses the schoolboy athlete, Dr. C. H. Andrewes, F.R.S., influenza in schools, Professor Alan Moncrieff growth and illness, and Dr. Wilfred Sheldon rheumatism in school-children.

Obituary

R. L. DODDS, M.Ch., F.R.C.S., F.R.C.O.G.

Mr. Robert Leslie Dodds died suddenly on Jan. 26 at the early age of 50. He was born in Dundee in 1898, the son of the Rev. R. W. Dodds, and received his education in Belfast, first at the Methodist College and later at Queen's University. He graduated with honours in 1920, and after holding various appointments, including that of demonstrator in anatomy, proceeded to take the F.R.C.S. in 1927 and the M.Ch. of his own university in the same year. Further resident experience followed in London, this time confined to the specialty he had chosen, and very soon he was appointed to the staff of the City of London Maternity Hospital, the Samaritan Hospital, and the French Hospital. Here Dodds was given scope to develop those abilities which had been evident early in his career. He rapidly reached the front rank as a skilful operator, and his advice on obstetric problems was widely sought.

When the London County Council took over the old Guardians' hospitals in 1934 Dodds was asked to help in the reorganization of their maternity services. Their present efficiency is largely a result of the work he did at that time and which he continued subsequently as consultant at St. James's Hospital. He was in addition obstetric consultant to the Ilford and Edmonton borough councils and to the Bearsted Memorial Hospital.

He had served in the 1914–18 war as a surgeon lieutenant in the R.N.V.R., and was on active service in destroyers. During the recent war he was a major in the R.A.M.C. for 18 months, being employed appropriately enough as surgeon to a troopship for part of that time. Towards the end of 1944 he had to relinquish his commission on the grounds of ill health.

Dodds had a natural charm which endeared him to all with whom he associated and combined with his innate modesty to make association with him a delight. His many friends and patients will mourn his passing and extend their sympathy to his widow, who assisted him so devotedly during his long illness.

Mr. R. Christie Brown writes: Leslie Dodds was my friend for 20 years and was one of the kindest and most generous of men. I have known few people who had his ability to endear themselves to so many. His most attractive quality was his humanity, and this, coupled with a wisdom which few possess, made him one of the best friends a man could have. His sense of humour and Irish wit were irresistible and also served his colleagues in very good stead, particularly in committee work. I have known many difficult situations saved by his ready wit. He was a universal donor, and in the days before blood banks this, and the fact that one could always count on his help in an emergency, must have cost him a lot physically. I recall two outstanding occasions on which Dodds came to my help by giving his blood to my patients, one of whom was the wife of a colleague whom I visited with Dodds. She was so ill with a ruptured ectopic gestation that we operated upon her in her own home. Dodds not only assisted me with the operation but gave the patient a transfusion of his own blood. I was a young man then, comparatively unaccustomed to dealing with such critical situations, and I have always felt grateful to him for the help so freely and unostentatiously given. The tragedy of his premature and sudden death is to me heightened by the feeling that we have lost not only a good friend and colleague but also someone who had the qualities of the humanitarian, with a regard for people as individuals, understanding and charity for their weaknesses, and tolerance for even the arrogant and the stupid. In the present state of the world such qualities tend to be at a discount, and the loss of any one of their champions is indeed tragic, but particularly so when the loss is also that of a personal friend.

W. E. FOGGIE, D.S.O., M.D., F.R.C.P.Ed.

Dr. William Edward Foggie, who died in Dundee on Jan. 13 at the age of 79, had been closely associated with the Dundee Royal Infirmary for fifty years. He was born in Dundee, and as a boy attended the High School there. On leaving school he went to Edinburgh University and entered the Faculty of Arts, taking the M.A. in 1889. Thereafter he studied medicine and graduated M.B., C.M. in 1893. He was then one of the only two resident medical officers in Dundee Royal Infirmary for a time. He settled in practice in his native town, and in 1899 was appointed to the staff of the Infirmary as assistant physician. In 1907 Dr. Foggie was promoted visiting physician for diseases of the skin, and held this appointment for twelve years, which included, however, a long absence on military service. When he came back from France he returned to the medical side of the Infirmary, and from 1922 till 1932, the year of his retiral, he was senior visiting physician. Dr. Foggie continued to act as physician to the Royal Victoria Hospital and the Sidlaw Sanatorium. He was also for many years a teaching member of the staff of St. Andrews University, holding a lectureship first in dermatology and afterwards in clinical medicine.

In the 1914–18 war Dr. Foggie served with distinction. He was mobilized as a Territorial in 1914, and in 1915 went to France in command of the 3rd Highland Field Ambulance in the 51st (Highland) Division. He served throughout in France and Belgium till demobilization in 1919. In 1918, when he held the rank of lieutenant-colonel, he was awarded the D.S.O. He became a member of the Royal College of Physicians of Edinburgh in 1922, and in 1926 was elected to the fellowship. He will be remembered by an older generation as a member of the Association of Physicians, on the executive of which he served for three years. He had been a member of the B.M.A. since 1894, and was president of the Dundee Branch in 1933–4. His health began to fail gradually over a year ago, but he was able to get about until some two months before his death.

Dr. Foggie was held in high regard by his colleagues for his clinical acumen, wise counsel, and unfailing good humour. He was an excellent teacher of medical students, who recognized in him a good physician and a good friend.

Dr. PHILIP HEWER WELLS died at the age of 56 on Jan. 17 at Stratford-on-Avon after a long illness. The third son of Arthur Lethbridge Wells, who was senior surgeon to the Central London Ophthalmic Hospital, he was related on his mother's side to a long line of medical men, several of whom were intimately connected with St. Bartholomew's Hospital. Dr. Wells qualified there in 1915. He was awarded the Brackenbury Scholarship, the Kirkes Scholarship and Medal, and the Willett Medal, and he was elected president of the Abernethian Society. After acting as house-physician to Lord Horder he joined the R.A.M.C. and was appointed medical officer to the 2nd Battalion Coldstream Guards, a regiment of which he remained immensely proud. Within eighteen months he was awarded the M.C. and bar, and later served a short period in Russia. Returning to civil life he acted as house-physician at the Radcliffe Infirmary, took the M.R.C.P., and went into general practice with his uncle, Mr. Earnshaw Hewer, F.R.C.S., in Stratford-on-Avon. Here he spent the whole of his working life. On the outbreak of war in 1939 he was appointed as medical specialist to the 10th British General Hospital and went to France. After the evacuation he held a number of appointments until in 1943, while acting as consulting physician to the South-Eastern Command, his health broke down and he was later invalided out with the rank of lieutenant-colonel. On his return to Stratford-on-Avon, with great courage he continued to work as long as this was physically possible. Dr. Wells was a man of great physical strength, a fine athlete, and an excellent player of ball games, in which he delighted. But with all his qualifications he will be best remembered for his forceful personality, his spontaneous generosity, and his uncompromising defence of what he considered to be the right. He leaves a widow, two sons, and two daughters.

H. G. writes: Now that Philip Wells has left us, it seems fitting to recall the great man with whom I worked rather than the shadow of his former self that his illness had made him during the last year of his life. I was privileged to become his junior partner nearly twenty years ago, and soon learned to realize his outstanding personality and the magnificent mental and physical capacities with which he had been endowed. He

had the highest integrity and expected the same standards from his colleagues and from all with whom he came in contact. Like all strong men, he had that capacity for gentleness which showed itself during his rare excursions into surgery, but mostly in his dealing with children, who all loved him, and whose care was his especial pleasure. Among many recollections are his guidance and encouragement in difficult midwifery; the effortless accuracy of his mashie shots; the terrific force of his first service; and the roars of laughter which his mimicry evoked. When he left in 1939 to rejoin the Army there was something missing from among us which, alas, never returned in full, as he was a sick man when we saw him again. What we missed the Army gained. Many of those who served with him have spoken of him with great affection and will, I know, share our sense of loss. His life was all too short, but his memory will gladden the hearts of many of us for as long as we live.

Dr. GRAHAME RIGBY RAWLINGS, who died on Nov. 23, 1948, at the age of 37, was anaesthetist to the Dorset County Hospital. He took his Conjoint qualification in 1935, graduated M.B., B.Chir. at Cambridge, and took the D.A. in 1937. He was casualty officer and house-physician at St. Thomas's Hospital, and then became senior resident anaesthetist there. In 1938 he went to Calcutta, where he was an anaesthetist on the honorary staff of the Presidency General Hospital. During his years in India he was an energetic and successful practitioner of anaesthesia and of general medicine, and was soon acknowledged as one of the leading anaesthetists in the country. He had a fertile and inventive mind and great mechanical ingenuity, and did much work on the development of apparatus and appliances. He left India in 1948 to devote his full time to anaesthesia in this country. His early death is a great loss to the profession.—R. F. W.

Dr. EDWARD KEITH MULINDER died in New Zealand on Dec. 9, 1948, at the age of 40. Dr. Mulinder was born in New Zealand, and was educated there, graduating M.B., Ch.B. in 1933. He came to England in 1935 for further study and experience. From 1936 onwards he was employed in L.C.C. mental hospitals at Friern and Tooting Bec. He had taken the D.P.M. in 1938, and he joined the R.A.M.C. as a specialist, serving as area psychiatrist in various parts of England. On the opening of the Second Front, Major Mulinder went to Normandy with the advanced section of the 32nd British Psychiatric Hospital which landed on D+18. Following the battles of Caen and the Falaise Gap he wrote an article which was published in this *Journal*. Mulinder served in psychiatric hospitals in N.W. Europe till after the end of the war and, on returning to England, at Banstead Hospital, Surrey. He was demobilized in 1946 and returned to New Zealand to take up an appointment in the Mental Hospitals Department. Until recently Dr. Mulinder was medical officer at Kingseat Hospital, Papakura, where he was held in high esteem by both the staff and the patients. His early death is a great loss to the profession. Dr. Mulinder is survived by his widow and four young daughters, all of whom were born in England.

Dr. WILLIAM JOHN YOUNG, who died on Dec. 28, 1948, at the age of 79, was one of the best-known practitioners in Cambridgeshire. He qualified first as a chemist after serving an apprenticeship, and then took the L.R.C.P., M.R.C.S. in 1900 after studying medicine at Liverpool University. As a student Young won the Torr Gold Medal and the Senior Lyon Jones Scholarship for Anatomy. He became a demonstrator at the new medical school, and he also assisted Professor A. M. Paterson in preparing the dissections for the illustration of Cunningham's *Textbook of Anatomy*. He settled at Harston, Cambridgeshire, soon after qualifying, and he remained in practice there until 1945. A man of great energy of mind and body, in the early days he found horses too slow and took to the bicycle, often covering over thirty miles a day. Because of the bad roads, Young was often to be seen in winter riding across field paths and sidewalks. Outspoken, a hater of humbug, yet tender in the presence of great trouble, he endeared himself to his patients, and he never refused an emergency call. Midwifery was one of Young's special interests. He safely delivered over 2,000 babies and counted it a blessing that he never lost a mother in labour. In the 1914–18 war Young was visiting patients as early as 7.30 a.m., and at 10 a.m. he began a day's work presiding over medical boards, returning home in time to pay evening visits and conduct his surgery. Always an enthusiastic member of the local medical society, he was frequently heard reading papers or in discussions. He represented the Cambridge and Huntingdon Branch at the annual meeting held at Aberdeen in 1914 and at three London meetings. He was honorary secretary of the Division in 1924–5 and president in 1927–8. Dr. Young's recreations included village cricket, tennis, swimming, reading, and he was particularly interested in French and in the Greek classics. For over fifty years he read daily a part of the Bible, and he imposed upon himself a rigid self-discipline. The esteem of all his friends was demonstrated on the occasion of his seventy-fifth birthday and his official retirement. A presentation was made to him by over 1,000 friends and patients from the twenty-two villages he served. His own words seem a fitting conclusion: "In my wildest dreams I never thought of anything of this kind. During my forty-four years here I have made some attempt to live up to the high traditions of medical service and follow them as far as I could. To find myself in these circumstances is rather an overwhelming triumph." His life was a triumph—he loved his profession and no one asked his help in vain. His gentle nature and indomitable spirit made him a living example to others.—C. W.

Dr. WILLIAM HENRY PASSMORE died on Dec. 31, at the age of 76, in Carshalton, where he had practised for over forty-five years. Passmore had been a man of great energy, with many activities outside his general practice. His surgical ability was great, and was recognized by his fellow practitioners over a wide area. He was a general-practitioner surgeon of the best type, knowing his limitations, but an expert in dealing with abdominal emergencies and with fractures. Under his influence the Carshalton War Memorial Hospital, to which he gave so many years of voluntary service, had a deservedly high reputation. In his younger days he had passed the primary examination for the F.R.C.S. and had been prosector at the College, and with a natural surgical aptitude he developed a fine technique. He had been resident obstetric officer at Charing Cross Hospital, where he qualified in 1899, and retained his interest in midwifery. His acknowledged skill in this subject led to his appointment as consulting gynaecologist to the Carshalton U.D.C. In the 1914–18 war his energy was such that he became surgeon to the two large Red Cross hospitals at Morden Hall and Morden Grange at a time when his young partner had left for service in France. Passmore managed it all by doing two hours' work at the hospitals before breakfast. In 1919 he was one of the founders of the Sutton and District Medical Society, which has continued with great success, and he was its first treasurer. It was mainly due to Passmore's energy in raising money that the War Memorial Hospital, Carshalton, was opened and finished completely free of debt. Passmore was to many of his patients not merely a doctor but one who became their wise counsellor and a lifelong friend. Those who knew him well will, above all, think of him as a lovable personality who gave his energies to the benefit of his neighbours, and will ever hold him in their memories with affection. He is survived by his widow, who was of exceptional help to him in his professional work, and by his son and daughter.—T. H. W.

Dr. ALBERT ERNEST HODGSON died at his home in Maghull, near Liverpool, on Jan. 2 at the age of 68. Apart from the interruptions of two world wars the whole of his professional life was spent in the treatment of infectious disease. Dr. Hodgson was born in Redcar. His medical education was at Cambridge and Edinburgh, and he graduated M.B., Ch.B. in 1903. In 1911 he proceeded M.D., and was commended for his thesis on the treatment of diphtheria. He took his D.P.H. at Cambridge in 1906, and in that year was appointed R.M.O. at the City Hospital East (Mill Lane), Liverpool, where he had his first extensive experience of diphtheria and other infectious diseases. This period was broken by his specialist service in the R.A.M.C. from 1914–19 in India and at Salonika and Malta. On his return to England he was appointed officer in charge of the North-West Area bacteriological laboratory and cerebro-spinal centre at Kinmel Park. It was here that he met his wife-to-be, Norah Lelean, sister of Professor Lelean, who held an administrative nursing post there. This was an ideal marriage, though there were no children. His wife's death, about ten years ago after a period of illness, was a very great blow to Dr. Hodgson. In March, 1919, he was appointed principal medical officer at Fazakerley Hospital, Liverpool, serving under Claude Rundle, whose methods of bed-isolation and cubicle nursing he eagerly followed. At this time Rundle and he drew attention to the need for larger doses of antitoxin owing to increased gravity of diphtheria, which ten years later were shown to be due to particular strains of the diphtheria bacillus. In 1934 Hodgson succeeded Rundle as medical superintendent. He was keenly interested in the treatment of anthrax, in which he had great success, having a consecutive series of 100 cases without a death. He wrote a number of articles on this subject, and his work was widely appreciated, especially by those in the hides and tannery industries. Dr. Hodgson was a vice-president of the Liverpool Medical Institution and was also lecturer on infectious diseases in Liverpool University. He

retired in August, 1946. Hodgson was of a gentle and affectionate disposition and was universally popular with patients and their relatives, with the hospital staff, and with the profession. One sister survives him.

Dr. WILLIAM JOHN LEACH, of Beauly, Inverness-shire, died suddenly on Jan. 9 at the early age of 48. After graduating M.B., Ch.B. at the University of Aberdeen in 1924, and holding an appointment as house-surgeon in the Sick Children's Hospital there, he returned home to take over the practice of his father, Dr. John Leach, in Beauly. The "young doctor" soon endeared himself to the patients in his practice, which covered an extensive country area and included a large proportion of work under the Highlands and Islands Medical Service. His visits necessitated many arduous journeys to the hills and glens, and required no little physical endurance as well as skill and ingenuity in the home management of isolated cases. In the busy life of a country doctor he found time to keep up to date with medical literature, and was an enthusiastic attendant at clinical meetings. A keen member of the British Medical Association since 1928, Dr. Leach was president of the Northern Counties of Scotland Branch from 1939 to 1946; he represented the Inverness Division at annual representative meetings in 1938 and 1943, and was a member of the Insurance Acts Committee and of the Scottish Subcommittee of the Insurance Acts Committee for several years. Dr. Leach, who was greatly interested in many forms of sport, was a good horseman and was also commodore of the Beauly Firth Yacht Club. A genial companion, a man of generous impulse and ever anxious to help in the furtherance of any good object in his community, Dr. Leach was held in high esteem by a wide circle of friends in the Beauly district, and his death will be felt as a deep loss by them. He is survived by his widow and daughter, to whom the sympathy of his colleagues will be extended.

Dr. VALENTINE HENRY BLAKE died suddenly on Jan. 10. at the age of 67, at his home in Great Yarmouth. He was the elder of the two sons of the late Dr. Henry Blake of that town; the younger brother is Major-General H. H. Blake, late A.M.S. Valentine Blake was educated at Yarmouth and at Bedford. He gained an entrance scholarship at St. George's Hospital, London, and graduated as M.B., B.S. in 1905. He was house-surgeon at St. George's, and afterwards at the Cancer Hospital, Fulham Road. He then joined his father in practice in their home town. He was honorary surgeon to the Great Yarmouth Hospital from 1909 to 1946, and all his work was characterized by single-minded devotion to his duty and his patients. On retiring, he was appointed honorary consulting surgeon. In 1947 Dr. Blake had to retire completely from practice because of a dissecting aneurysm and coronary thrombosis which together caused his untimely death. During the first world war he served in the R.A.M.C. in Egypt and in France, and was mentioned in dispatches. He had been a certifying surgeon under the Factories Acts and Trinity House medical officer for the Yarmouth district. In 1933–4 he was president of the Norwich Medico-Chirurgical Society and in 1942–4 of the Norfolk Branch of the B.M.A. In all these varied activities Blake displayed the qualities of earnestness, keenness, and intelligence which he had shown in his student career. Nothing was too much trouble for him, particularly during the grim days of air raids. In earlier days he was prominent as a swimmer and a motor-cyclist, at both of which sports he won trophies. In later years he was a proficient shot and fisherman. Dr. Blake married, in 1926, Enid, daughter of Dr. Hedley Bartlett, of Saffron Walden, who survives him with their two sons and one daughter; the elder son proposes to enter his father's profession.

Dr. EDWIN LEONARD LEES, of Clifton, Bristol, died on Jan. 10 at the age of 85. He was born at St. Andrews, and his father was a surgeon in the I.M.S. who died of typhoid fever at the early age of 36. His medical education was at Edinburgh and Bristol. He graduated M.B., C.M. at Edinburgh in 1885, and proceeded M.D. in 1890. He came south to Bristol in 1884, and on qualifying went into general practice as an assistant to Dr. Coleman. For sixty-one years, until his retirement in 1945, he was in charge of a large general practice, the arduous duties of which he carried out with entire unselfishness and devotion. Dr. Lees was a man of strong personality who took the greatest interest in his patients, to whom he was not only a doctor but a guide and friend. In addition to his general practice he had a particular interest in the diseases of children. He held in succession the appointments of house-surgeon, registrar, and physician on the staff of the Royal Hospital for Sick Children and Women in Bristol, being appointed consultant physician on his retirement. There are many who will regret the loss of a friend and counsellor and who will deeply sympathize with his widow and the six children who survive him.

Dr. HUGH HOWIE BORLAND, who was 91, died on Jan. 12 after a long illness. He graduated M.B., C.M. at Glasgow in 1896, and took the Cambridge D.P.H. in 1899. After holding resident appointments at the Western Infirmary, Glasgow, and at the Maternity Hospital, he went into general practice in the Dennistoun district of Glasgow, and became one of the clinical tutors at the Royal Infirmary. In the first world war he acted as medical officer at Duke Street prison. The fact that Dr. Borland was elected Deacon of the Incorporation of Barbers testifies to the respect in which he was held by his fellow citizens. He was an elder of St. John's Church, Renfield, and in other ways showed his interest in religious work. He was a man of high personal character, a kind friend, and a loyal colleague.—T. K. M.

Dr. PERCY ARTHUR STOREY died at his home in London on Jan. 16 at the age of 79. Dr. Storey was educated at Brighton College and University College, London, and qualified M.R.C.S., L.R.C.P. in 1894. In 1918 he graduated M.D. of the University of Durham. Always a general practitioner, he practised in St. Marylebone for fifty-four years until his retirement about two years ago. His work there was interrupted only when he served in the R.A.M.C. in the 1914–18 war. During the recent war he worked with the Marylebone A.R.P. services. He was a member of the Harveian Society of London and of the Chelsea Clinical Society. A Fellow of the Zoological Society of London, he took a great interest in animals, and he had a particularly fine collection of butterflies.

Dr. LOUISE WHITMAN FARNAM WILSON died at Hove on Jan. 21. She received her medical education and graduated M.D. at the University of Yale in 1920. She then started work in the mission field in China at the Hunnan-Yale Medical College. She got great satisfaction from that work, and in the course of it met her English husband. Returning with him to this country she spent the next two years studying for the L.R.C.P. and M.R.C.S., which she took in 1936. Dr. Wilson then undertook temporary work in general practice in London. Shortly afterwards she helped in some research work with Dr. Leonard Colebrook. At the outbreak of war she settled down in rural general practice in Sussex. In recent years she bore with great patience and fortitude a long and trying illness. Louise Wilson had the freshness of outlook of the American combined with a determined desire to get to the bottom of any subject which interested her. In the most gentle manner she would enunciate the boldest ideas, but she was tolerant of criticism and in fact eager for it. The crowded congregation at the memorial service at Keymer Church on Jan. 29 showed well the devotion of her old patients, many of whom had come long distances in order to be present.

Professor R. J. Willan writes: The sudden death of Mr. Stanley Raw (*Journal*, Jan. 22, p. 158) caused widespread regret in Sunderland and in the North of England, where he had an extensive and successful surgical practice. Until recently Mr. Raw was senior surgeon to the Royal Infirmary, Sunderland, and to the Sunderland Municipal Hospital. To both hospitals he rendered yeoman service, both clinically and administratively. A man of sound clinical judgment, an operator of outstanding merit, he was also an acceptable lecturer and teacher. He was an ideal chief of a clinic, for he took a great personal interest in his juniors, whom he so ably guided and encouraged in their work. He had a large practice associated with the Workmen's Compensation Act, particularly among the Durham coal-miners. There was a remarkable mutual understanding and respect between him and his collier patients, and Raw's opinion was seldom challenged, and if challenged was seldom held to be in the wrong. He was a fellow of the Association of Surgeons of Great Britain and Ireland. He took a prominent part in the amalgamation of the Northumberland and Durham Medical Society with the Newcastle Clinical Society, which then became the present Newcastle-upon-Tyne and Northern Counties Medical Society. In due course he became president of the new society, and his scholarly presidential address, "Handing on the Torch," is still remembered with pleasure. Apart from his professional eminence, his life included many interests. He loved climbing, travelling the oceans, sailing small boats, and was a golfer with a low handicap. He was very happily married, and his wife shared his many interests. A man of commanding stature and great physical strength, he had climbed the mountains of many

countries. Recently, during a South Atlantic pleasure cruise, he visited the island of Tristan da Cunha, where he had the unusual experience of climbing the 7,640-ft. mountain of the island, a feat that, through lack of opportunity and lack of dependable weather conditions, cannot often have been performed by a visitor. His generosity was proverbial among his friends, and probably no one in need ever asked his help in vain. He had a keen sense of humour, was exceptionally well read, had a fund of good stories, and could be relied upon as a witty after-dinner speaker. So there has passed a man of outstanding character, a man full of humanity, and a great gentleman whom it was an honour to have known. Mrs. Raw can be assured of the sincere sympathy of his many friends in her irreparable loss.

Dr. R. W. Lee writes: I was grieved beyond measure to read of the death of Dr. William Susman (*Journal*, Jan. 8, p. 76), and should like to pay tribute to him as I knew him many years ago. We served together in the same infantry company in France in 1917 and 1918 as very junior officers. Inevitably he was known as "Susie," and it was always a treat to hear his platoon singing a popular song relating to a certain "Sister Susie" as they followed him on a march. With his rich Canadian slang, no doubt toned down in later years, a gaiety that persisted at all times, and courage of a high order, he was a much-loved figure. A handy man with his favourite weapon, the Lewis gun, he achieved fame as a gunman, Wild West type, by a fluke in which he smashed the company commander's walking-stick with a revolver at twenty paces. The owner's wrath and the marksman's joy were roughly equal. In one typical exploit he disobeyed strict orders when, alone and unarmed, he explored an unhealthy no-man's-land on a dark, wet night in search of a reconnaissance patrol that had been given up as lost. By another fluke contact was made, and he led them home rejoicing on a route laid down by a ball of string. It is in particular gratitude for that action, involving very great risk, that I wish to record some appreciation of Susman as a very gallant officer.

Medico-Legal

PENSION AFTER HUSBAND'S SUICIDE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

The law concerning war pensions establishes a strong presumption in favour of the applicant that the condition of disability (or death) is the result of service. In a disputed case the Minister of Pensions has to prove the negative, often a very difficult task.

In *Duff* v. *Minister of Pensions*, a recent Scottish case,[1] a Glasgow tram driver who had been concerned in a fatal accident had a nervous disturbance and gave up his job. Next month he was called up for military service but deferred for six months. When this period had elapsed he was drafted into the infantry, and two weeks later his body was found in the sea. There was no doubt that he had committed suicide. His widow claimed a pension, but her application was refused and her appeal to the tribunal rejected. She then appealed to the Court of Session, and won.

Lord Thomson, the Lord Justice Clerk, observed that the pensions tribunal had held it proved that the deceased had committed suicide because he was depressed when he enlisted, and that the depression was a continuation of a pre-Service neurotic illness from which he had never recovered. The tribunal had also held that his very brief Army life had been happy. His Lordship's brother judges and he could not help feeling that there was involved in that cryptic finding the idea that there was need only to establish that the deceased's Army life had been such as would not upset a normal man. The court did not think that this was the proper test. The test must be an individual test, and the tribunal must ask itself what was the effect of Service conditions on this particular man. There was no evidence to enable the court to affirm that Service conditions had not played a part in aggravating the man's depression and so precipitating the tragedy. The court therefore allowed the appeal and the widow gained her pension.

[1] *Scotsman*, Dec. 11, 1948.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on Dec. 16, 1948, the following degrees were conferred:

D.M.—A. E. Mourant.

B.M.—H. E. Reiss, D. F. Mullins, M. H. Hall, *Mrs. Joan W. Kipling, *Janet E. McKinstry.

* *In absentia.*

UNIVERSITY OF CAMBRIDGE

The medical committee of the Board of Governors of the United Cambridge Hospitals has elected Claude Howard Whittle, M.D., F.R.C.P., a member of the Faculty Board of Medicine for the two years ending Dec. 31, 1950.

The following degrees were conferred in Congregation on Jan. 21:

M.A.—Joan Mary Boissard, M.R.C.S., L.R.C.P., University Assistant Director of the Public Health Laboratory, and James Wilson Millen, M.D., University Lecturer in Anatomy.

M.B., B.CHIR.—*G. C. Myddelton, G. R. Hervey, *R. D. Allen, *C. B. McKerrow, *J. G. O. W. Yerburgh, *G. P. Blanshard, *Alexis Brook, *D. R. Harrocks, *A. R. H. Hicks, *P. H. Lord, *F. R. Ryle, *K. H. L. Scougall, J. B. Howells, *J. C. Wardill, *J. L. Millard, *R. A. Rowan, E. W. Helming, *J. A. Balint, *T. M. Robinson, *C. D. Thompson, *N. P. L. Wildy, *R. E. Wright, L. Linder, *H. E. Flint, *R. S. Smith, *T. J. D. Walker, *A. L. Wells, *K. W. Leech, *J. V. Earle, *J. D. Llywelyn-Jones, *T. B. Boulton, *R. D. Cundall, *P. G. R. Dench, *G. A. D. Lavy, *G. M. Jones, T. H. H. Wade, *J. R. Edsall, *June Bean, *Daphne E. Lewin.

* By proxy.

UNIVERSITY OF GLASGOW

At a Graduation Ceremony held on Jan. 15, the following medical degrees were conferred:

M.D.—G. C. Arneil, K. C. Hutchin, A. W. Lees, G. Leslie, J. S. Stevenson.

M.B., CH.B.—A. H. Alexander, C. I. S. Bartlett, Mary P. S. Borland, Lucy McL. C. Boyd, Mary B. S. Calder, A. Carnochan, Mary E. Catto, Agnes A. Coughtrie, R. McL. Douglas, W. I. L. Fraser, G. L. Gibson, D. A. Haldane, Mary M. Hamilton, A. C. Howie, A. N. Hunter, B. Joels, *Elizabeth M. S. Kilpatrick (Mrs. Wotherspoon), Anne K. Kirkland, D. A. Knox, R. R. Lang, D. McC. Macgregor, J. MacKay, A. M. Mechie, A. P. Miller, A. R. Morrison, J. Morton, J. J. Mullen, P. R. Probert, J. D. Read, H. A. Roemmele, L. Rose, Christina C. Stevenson, I. O. Stewart, J. Stewart, J. A. M. Stewart, R. E. Stewart, W. S. Stoddart, P. Stuart, H. W. Thomas, D. B. Turnbull, J. M. Uku, J. Wright.

* *In absentia.*

UNIVERSITY OF MANCHESTER

William Ian Clinch Morris, M.B., Ch.B., F.R.C.S.Ed., M.R.C.O.G., has been appointed whole-time Professor of Obstetrics and Gynaecology and Director of the Department, in succession to the late Professor Daniel Dougal.

UNIVERSITY OF WALES

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examinations indicated.

HYGIENE.—Lilian J. Cunningham, H. B. Jenkins, Nano J. Morgan, D. St. J. D. Rees.

OBSTETRICS AND GYNAECOLOGY.—Marjorie J. Adams, Mary P. E. Alban, F. W. Beswick, M. L. Cattell, R. B. Davies, Elizabeth B. Dew, D. C. Dymond, L. Elton, A. R. Evans, K. Gammon, P. H. Griffiths, E. I. Gwynne, G. E. Heard, J. I. Hopkins, June D. James, H. B. Jenkins, Ruth E. Lewis, M. G. Lloyd, Nano J. Morgan, Rhona E. Morgan, B. Phillips, H. M. N. Rees, J. A. E. Richards, R. M. Richards, *D. C. Saunders, J. A. Stanton, D. G. H. Thomas, E. Thomas, J. D. Thomas, J. G. H. Thomas, S. Thomas.

SURGERY.—Mary P. E. Alban, *F. W. Beswick, M. L. Cattell, Elizabeth B. Dew, L. Elton, E. H. Evans, K. Gammon, P. H. Griffiths, G. E. Heard, June D. James, T. D. Jones, Ruth E. Lewis, M. G. Lloyd, Rhona E. Morgan, B. Phillips, J. A. E. Richards, R. M. Richards, *D. C. Saunders, C. P. Seager, J. A. Stanton, Brenda M. Thomas, E. Thomas, J. G. H. Thomas.

*With distinction.

The following candidates at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

DIPLOMA IN PUBLIC HEALTH.—I. A. Bolz, J. W. Bowen, R. Glenn, F. J. Hallinan, F. C. R. Harvey, *R. A. N. Hitchens, Amelia Rowles, G. F. J. Thomas.

* With distinction.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a meeting of the College held on Jan. 27, with the president, Lord Moran, in the chair, Sir W. Dalrymple-Champneys was elected to represent the College at the Health Congress of the Royal Sanitary Institute, to be held at Brighton from May 23 to 27, and Professor A. A. Moncrieff was re-elected representative on the Colonial Medical Advisory Committee.

Membership

The following candidates, having satisfied the Censors' Board, were elected Members:

D. M. Abelson, M.B., L. E. Arundell, M.B., J. Badenoch, B.M., R. G. Benians, M.B., E. R. Bickerstaff, M.D., J. D. Blainey, M.B., J. P. P. Bradshaw, M.B., B. C. Brown, M.D., P. E. Brown, M.B., Flight Lieutenant, R.A.F.M.S., Alice M. Bush, M.B., R. J. Calvert, M.B., K. M. Chalmers, M.B., J. B. Cochran, M.B., J. S. Crowther, M.B., D. Davies, M.B., J. F. Delafresnaye, M.D., E. M. C.

Dunlop, M.D., T. B. Dunn, M.B., G. F. Edwards, M.B.E., M.B., Major, R.A.M.C., H. L. English, M.B., O. D. Fisher, M.B., R. M. Forrester, M.B., F. M. Garvie, B.M., P. B. B. Gatenby, M.B., H. J. Goldsmith, M.B., A. Grant, M.D., A. P. Grant, M.D., L. J. Grant, M.B., I. Grayce, M.B., C. W. E. B. Greaves, L.R.C.P., D. McR. Hanna, M.B., T. D. B. Hanratty, M.D., P. L. de V. Hart, M.B., F. C. J. Haynoe, M.B., C. B. Henderson, M.B., A. C. S. Hobson, M.C., M.B., F. C. Horner, R.A.M.C., G. K. H. Hodgkin, B.M., K. S. Holt, M.B., J. N. Horne, L.R.C.P., W. M. Irwin, M.B., E. W. Jackson, M.D., D. V. M. Jones, L.R.C.P., N. B. Jones, M.B., P. G. Keates, M.D., Madeline K. Keech, M.B., Mohammed A. Khan, M.B., L. G. Kiloh, M.B., R. King-Brown, M.D., W. M. Lancaster, M.B., D. Lawrence, M.D., J. C. Macaulay, M.B., R. B. McConnell, M.B., E. L. McDonald, M.B., A. E. Macintosh, M.B., A. McPherson, M.B., R. I. Meanock, M.D., A. P. Meiklejohn, B.M., D. E. Meredith, M.D., C. Merskey, M.D., M. J. Meynell, M.D., E. F. D. Montuschi, M.D., D. Morris, L.R.C.P., B. K. Naik, M.B., L. D. Osier, M.B., R. T. Parkin, M.B., J. Pepys, M.B., G. W. Poole, M.B., S. R. Reader, M.B., E. A. Ritchie, M.B., A. J. Robertson, M.B., L. J. Rowley, M.B., E. Sanders, M.B., L. G. Scott, M.B., K. R. Shroff, M.B., J. A. Simpson, M.B., S. Smith, M.D., A. E. Thomas, M.B., A. D. Thomson, M.B., D. Q. Trounce, M.B., J. S. Watson, M.B., R. W. E. Watts, M.B., Captain, R.A.M.C., I. G. Wickes, M.B., J. R. Wilson, M.B., R. A. Womersley, M.B.

Licences

Licences to practise were conferred upon the following 134 candidates (including 27 women) who had passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and who have complied with the necessary laws:

L. A. A. Adams, Mari Ainsleigh-Jones, R. D. Allen, A. Allibone, D. W. Anniss, Mary P. Armstrong, Patricia Arnold, A. H. W. Bain, J. A. Balint, A. A. Bartholomew, D. A. A. Beardsmore, T. Bell, L. C. Bellsham-Revell, J. F. Bennett, C. A. Biscoe, I. F. Bishop, J. B. F. Boyle, Maria E. B. Brennan, Sylvia M. Brown, T. W. Brown, T. V. Campkin, J. Cantor, J. W. Cieszynski, K. M. Citron, W. E. Clifford, O. F. Conran, G. A. Coombs, F. H. Corbitt, E. H. J. Cotter, Patricia Q. Currie, T. A. Daff, Shirin Dastur, G. L. Davies, Joyce M. Daws, J. M. Dodd, G. H. Dunkerley, Audrey M. Emmerson, J. B. C. Evelegh, J. G. Fairer, O. Fleischner, H. E. Flint, Margaret Ford, A. T. T. Forrester, P. G. Fox, Elizabeth M. France, Jean M. Gibson, J. G. Gill, U. S. Gill, R. G. Godfrey, M. M. Gollow, A. J. Graham, J. C. Graham-Stewart, M. Grant, Margaret I. Green, D. G. G. Greenaway, Wendy E. Greengross, D. H. Griffiths, A. K. Hancock, D. T. G. Harris, Kathleen J. Harrison, Gladys F. Horton, E. T. Hughes, T. J. M. Hughes, D. S. Hurwood, J. M. E. Hyde, B. Jacobs, A. V. Jenkins, D. G. Jenkins, I. M. Jones, G. Keen, P. W. L. Kelly, M. Lauchlan, Joan E. Lewis, T. McKendrick, D. J. Mantle, Ida Mather, A. H. Mendoza, G. G. Meynell, J. L. Millard, R. Mitchell, G. W. Moore, J. H. S. Morgan, D. Morris, B. C. Morson, G. V. Mulholland, J. G. B. Myles, C. Nagrath, E. J. Newton, J. G. Noble, K. Orr-Hughes, D. N. H. Owen, N. C. W. Owen, Joyce M. Parker, J. E. Phillips, S. Plumpton, B. Pollak, K. G. Prior, D. S. R chardson, I. H. Richardson, R. E. Richardson, Kathleen M. Roby, P. Ronchetti, P. T. C. Rowan, J. E. Russell, G. W. Scott, T. B. Scott, A. M. Sellars, F. M. M. Shattock, Muriel E. Sidaway, A. Southwell, H. W. Stanley, Ursula Stanley, A. E. Steel, R. R. Stephens, Sara I. Stinson, Elizabeth J. Sutton, Brenda A. Taylor, C. W. Taylor, G. B. Taylor, Mavis B. Taylor, J. N. R. Toke, D. O. Topp, G. J. Van Klaveren, I. S. Waller, R. D. Walsh, A. J. Walters, Monica Watson, P. S. Watson, J. D. Wheatcroft, I. C. L. White, D. A. G. Williams, J. D. Williams, T. E. Williams, G. T. Woods.

Diplomas

Diplomas in Anaesthetics, in Psychological Medicine, in Tropical Medicine and Hygiene, in Laryngology and Otology, in Medical Radio-Diagnosis, in Public Health, in Industrial Health, and in Medical Radiotherapy were granted jointly with the Royal College of Surgeons of England to the following successful candidates:

DIPLOMA IN ANAESTHETICS.—D. Davies, G. Kerr, and R. Sturton, and to the 34 successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England in the issue of Jan. 1 (p. 38).

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—B. W. Richards and to the 24 successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—To the 3 successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England in the issue of Jan. 1 (p. 38).

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—H. J. Doran, R. M. Harvey, D. J. Heffernan, A. R. Rowe, J. L. Wakelin, T. C. Fort, J. B. O'Mahony, and R. C. J. Rustomjee, and to the 21 successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

DIPLOMA IN MEDICAL RADIO-DIAGNOSIS.—D. M. R. Barry and J. W. Pierce and to the 21 successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England in the issue of Nov. 27, 1948 (p. 964).

DIPLOMA IN PUBLIC HEALTH.—R. Alexander, H. J. Anderson, R. L. Chopra, D. Couslant, C. D. Edwards, B. M. George, D. E. Jeremiah, B. G. Johnsen, A. P. Kalra, A. P. R. Lewis, D. K. Ll. Lindsay, W. D. H. McFarland, C. W. Maisey, Dorothy K. Paterson, F. O. Potter, Annie E. G. Rowlands, Joan N. Ruben, Victoria M. D. N. Shaw, Margaret S. Stevenson, R. N. E. Watt, P. West, J. L. M. Whitbread.

DIPLOMA IN INDUSTRIAL HEALTH.—J. W. Webb and to the 16 successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

DIPLOMA IN MEDICAL RADIOTHERAPY.—P. B. Woodyatt and to the 15 successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England in the issue of Nov. 27, 1948 (p. 964).

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on Jan. 13, 1949, with Lord Webb-Johnson, President, in the chair, Professor J. R. Learmonth was admitted to the Honorary Fellowship.

Mr. J. E. Piercy (London), Professor V. F. Lambert (Manchester), Mr. Norman Hodgson (Newcastle-upon-Tyne), and Mr. G. H. Buckley (Blackpool), being Fellows of the Royal College of Surgeons of Edinburgh, were elected *ad eundem* to the Fellowship.

Drs. George Feneley, A. Parry Brown, H. Grant-Whyte, and Geoffrey Kaye were elected Fellows of the Faculty of Anaesthetists.

A Diploma of Membership was granted to D. N. H. Owen and I. S. Waller.

A Diploma of Fellowship was granted to A. G. Jessiman.

Diplomas were granted jointly with the Royal College of Physicians of London as follows:

MEDICAL RADIO-DIAGNOSIS.—D. M. R. Barry.

ANAESTHETICS.—R. V. Sturton.

INDUSTRIAL HEALTH.—W. Blood, L. B. Bourne, J. A. Harrington, A. K. Hill, W. T. W. Lawson, R. F. L. Logan, A. C. Mackay, G. Milne, J. G. Mott, H. Mukhopadhyay, A. J. Patterson, J. R. Sen Gupta, G. Taylor, Margaret E. Thwaytes, T. E. M. Wardill, N. Williams.

LARYNGOLOGY AND OTOLOGY.—G. G. Allan, M. D. Cremin, K. H. Dalrymple, P. G. Jay, P. K. Khasnobis, R. M. Lang, H. A. J. Lister, I. Lopert, W. R. McKechnie, V. St. J. de C. Magian, W. H. Mirkin, Constance B. S. Napier, M. M. Nath, S. S. Ovanessoff, W. M. Owen, R. E. Peasegood, A. Schiller, C. T. T'ang, R. H. Welch, T. J. Wilmot, I. S. Young.

PSYCHOLOGICAL MEDICINE.—J. C. Baillie, R. F. B. Bennett, F. H. Bodman, E. A. Burkitt, F. R. M. Calder, S. Catterall, G. I. Davies, R. H. Gaman, J. K. Hewat, R. M. Jones, F. J. Kelleher, H. Lantin, I. Leveson, A. Limentani, S. C. MacMillan, J. W. Macpherson, D. H. D. Paine, R. A. Sandison, R. B. Taylor, W. N. Taylor, D. C. Watt, A. Wood, C. M. Xavier, F. L. D. Young.

Arrangements are being made for a combined course of lectures and clinical conferences, in relation to the surgery of childhood, to be held in London from July 4 to 8. Clinical conferences will be held each morning at selected children's hospitals followed in the afternoons by lectures at the College. The fee for the course will be £12 12s. or £10 10s. for Fellows and Members of the College and full-time students of the Institute. Further details will be announced in due course. Meanwhile applications, accompanied by a remittance, may be sent to the secretary, Postgraduate Education Committee, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2, or to the secretary, Institute of Child Health, the Hospital for Sick Children, Great Ormond Street, London, W.C.1.

The Services

The President of the U.S.A. has conferred the following decorations in recognition of distinguished services in the cause of the Allies:

Officer of Merit, Degree of Officer.—Colonel L. C. Mongomery, O.B.E., M.C., R.C.A.M.C.

Legion of Merit, Degree of Legionnaire. Bronze Star Medal.—Captain C. T. Robertson, M.B.E., R.C.A.M.C.

NORTH PERSIAN FORCES MEMORIAL

The North Persian Forces Memorial silver medal for 1947 has been awarded to J. N. P. Davies, M.B., Ch.B., for his paper entitled "The Pathology of Central African Natives," published in the *East African Medical Journal* The medal is awarded every year for the best paper on tropical medicine or tropical hygiene in any journal during the twelve months ending Dec. 31 by any medical officer of under twelve years' service in the R.N., the R.A.M.C., the R.A.F., or the Colonial Medical Service. The memorial was founded by officers of the R.A.M.C. and other Service medical officers who served with the North Persian Forces in the first World War.

DEATHS IN THE SERVICES

Lieutenant-Colonel JOHN WEMYSS GRANT died on Jan. 11 at the age of 79. After thirty years in the Indian Medical Service he retired to Broadstairs in 1931. He graduated from Aberdeen University in 1892 and on arrival in India was posted to the Royal Indian Marine survey ship *Investigator* as zoologist and medical officer. After a voyage in the *Investigator* Grant became medical officer to the 15th Sikhs and went through the Chitral expedition with them. He was later transferred to the political department. At different times he was residency surgeon to the Kingdom of Nepal, Muscat in the Persian Gulf, Bhopal in Central India, and Jodhpur in Rajputana. Most of his service was spent in the last-named State, which covers an area the size of Ireland. On completing his service he had the unusual honour of being presented with an illuminated address in an ivory casket. The ceremony took place in the centre of Jodhpur city in order to give everyone, from the highest to the poorest, the opportunity to bid farewell to their much-loved and respected friend. Colonel Grant's name appeared in the first list of recipients for the newly created Kaiser-i-Hind medal for distinguished public service in India. He earned the award during the great famine. The Maharajah of Nepal also bestowed on him the Order of the Star of Nepal, a distinction rarely given to foreigners. In the first world war Colonel Grant commanded an Indian General Hospital, first in Brighton and then in Mesopotamia. On the outbreak of hostilities in 1939 he was already serving on a medical board in Canterbury and later was given the task of organizing the medical arrangements for the Home Guard in the Thanet area. After undergoing a severe operation in 1943 his professional activities ceased. He leaves a widow, Mrs. Lilian Grant, who is a doctor.

Medical Notes in Parliament

Last N.H.I. Payment

On Jan. 27 Mr. BESWICK asked the Minister of Health when he expected to make a final payment under the former National Insurance Scheme to medical practitioners in Middlesex.

Mr. BEVAN answered that executive councils had been notified of the amounts available for the final payments to doctors in respect of medical benefit under the National Health Insurance Acts and had been asked to make the necessary payments to doctors as soon as possible.

Cost of N.H.S.

Sir THOMAS MOORE asked on Jan. 27 for the latest estimate for the current annual cost of the National Health Service, as divided amongst the main branches, together with the administration costs; and also for figures indicating the estimated income from contributors.

Mr. BEVAN replied that a supplementary estimate of the cost of the National Health Service for the period July 5, 1948, to March 31, 1949, divided among the main branches would shortly be laid before the House. The amount available from National Insurance contributions towards the cost of this Service was estimated to be £24,000,000 for the same period.

Teaching Hospitals in Scotland

Miss HERBISON asked on Jan. 25 which hospitals had been added to the list of teaching hospitals in Scotland since June, 1946.

Mr. WOODBURN replied that the bulk of medical teaching in Scotland was carried on in a few large general hospitals in the four centres Aberdeen, Dundee, Edinburgh, and Glasgow. The main teaching hospitals remained as in June, 1946. There was, however, an increasing use of other hospitals for teaching purposes both in the four centres and outside. In the interests of the hospital service as well as teaching, he was anxious to encourage this extension. Medical education committees to advise the regional hospital boards on this and other aspects of the provision of facilities for clinical teaching were about to begin work in each region.

Salaries of Medical Officers of Health

Mr. KEENAN on Jan. 27 asked Mr. Bevan what steps he proposed to take to help or assist local authorities to secure and retain the services of medical officers now that the salaries paid and offered were considered insufficient since the operation of the Health Service Act of July last.

Mr. BEVAN declared that, while expressing no view on the adequacy of these salaries, he was ready to join with the local authorities in establishing a Medical Whitley Council on which they could be discussed.

Antrycide

Mr. HALE asked on Jan. 26 for a statement on the use of "antrycide" in Africa.

Mr. CREECH JONES answered that field trials conducted throughout 1948 in Kenya, Uganda, and the Sudan showed that a single treatment with the new drug cured the two most important trypanosome diseases in cattle, *T. congolense* and *T. vivax*. It had also proved effective against trypanosome diseases which affected camels, horses, dogs, and pigs. In addition to its curative properties, antrycide afforded *protection* against trypanosome diseases. Trials were continuing to establish the duration of the period of protection. Limited supplies of the drug had been made available to Government veterinary departments in Africa. It was in use in Kenya, Uganda, and Nigeria (as well as in the Sudan). The effectiveness of the drug, particularly its prophylactic properties, would, it was hoped, improve the prospect of increased meat production in areas of Africa hitherto closed to domestic animals or precarious for them. He was examining the veterinary, agricultural, administrative, and other aspects of the development of animal husbandry in Africa made possible by the discovery of the drug. Initially it would be used to afford protection on stock routes and during seasonal migrations, but as supplies became more plentiful it was proposed to use it in combination with other methods of control to expand the present cattle-rearing areas. He was not in a position at this stage to estimate its ultimate effect on meat production in Africa.

Female Circumcision

Mr. HECTOR MCNEIL said on Jan. 26 that he had no precise information about the prevalence of female circumcision in the Sudan. He was assured that legislation passed in 1926 and the subsequent propaganda had checked this repulsive and harmful practice. Progress, however, in the face of such a long-established tradition was regrettably, if necessarily, slow.

No. 2

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 15

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1949 (a)	(b)	(c)	(d)	(e)	1948 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	28	1	30	3	1	47	3	13	2	—
Deaths		—	—				2	—		
Diphtheria	92	11	34	6	5	203	21	59	19	
Deaths	—	—	—	—	—	5	1	1	—	
Dysentery	70	27	37	—	7	96	4	37	2	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	—	—	—	1	1	—	2	—	—
Deaths		—					1			
Erysipelas			37	7	2			55	12	
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				32					28	
Deaths	42	3	11	3	1	49	5	15	6	
Measles*	10,922	320	108	57	151	3,304	240	899	137	—
Deaths†			—	1	—			—	—	—
Ophthalmia neonatorum	48	8	9	—	—	39	5	13	1	—
Deaths										
Paratyphoid fever	4	1	—	—	—	4	—	1 (B)	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	1,184	65	12	8	14	787	67	5	10	
Deaths (from influenza)‡	40	8	8	1	1	13	1	4	2	
Pneumonia, primary			488	43				253	38	
Deaths	365	53		16	11	468	50		9	
Polio-encephalitis, acute	3	—				2	—			
Deaths										
Poliomyelitis, acute	34	4	1	—	—	47	3	6	2	—
Deaths§	2	—				5	1			
Puerperal fever		—	5				3	11		—
Deaths										
Puerperal pyrexia¶	88	6	7	—	1	102	5	13	—	2
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	989	67	273	100	44	1,754	109	377	24	
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	5	—	1	3	—	2	—	1	4	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	2,825	172	304	67	61	2,343	160	46	49	
Deaths	6	1	1	—	—	6	1	—	—	—
Deaths (0–1 year)	365	46	75	24	13	415	55	66	27	2
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,215	956	869	239	155	5,248	850	617	198	12
Annual death rate (per 1,000 persons living)			17·5	14·8				12·8	12·4	
Live births	7,636	1224	972	422	220	8,510	1397	920	412	285
Annual rate per 1,000 persons living			19·6	26·2				18·5	25·8	
Stillbirths	179	20	44			252	29	25		
Rate per 1,000 total births (including stillborn)			43					26		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

¶ Includes puerperal fever for England and Wales, Eire, and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Influenza

There has been no important epidemiological change since last week. Deaths from influenza in the great towns in the week ended Jan. 22 numbered 45, as against 40 in the previous week. These are very low figures for this time of year. There have been a few more reports of small outbreaks of a disease which appears on clinical grounds to be true epidemic influenza of a mild type. At least one of these could be directly associated with an importation from the Continent. No large outbreaks have been reported.

Typing of specimens of virus obtained from abroad and from cases in this country is proceeding, but final results are not yet available. From preliminary tests, however, it appears that the virus responsible may be the variant of virus A which appeared in this country at the beginning of 1947. If this is so, there may be good reason to hope that some measure of immunity still lingers in the population of England and Wales and that a serious epidemic is unlikely.

Spread in Europe.—According to reports reaching the World Health Organization up to Jan. 18, Albania, Ireland, and Portugal have had only a few mild cases. Cases of influenza first noted in mid-December in Bulgaria have been characterized by their remarkably mild but prolonged character and have mainly affected very young children and the aged.

By Jan. 14 almost the whole territory of France had been involved in an epidemic which affected about 20% of the population. Although generally of a mild type, the disease has provided a certain number of serious, and even fatal, cases, particularly among very young children and old people.

Cases have been sporadic and of a mild character in Greece and Poland. In Switzerland thirteen cantons have been affected, particularly Tessin, Geneva, Schaffhouse, and Basle city.

Identification of Viruses.—Virus A was identified in 50% of the specimens taken from patients in the Lyons region. A virus was also isolated which does not appear to belong to either type A or to type B, and work on the identification of this virus is proceeding at the Pasteur Institute in Paris. More recent information suggests that the prevalent French strain corresponds with the virus isolated in Holland, and this is probably identical with the Italian strain.

Influenza virus A has been identified in the southern part of Holland by Professor J. Mulder, of the University of Leiden. The subtype is not clear, and is probably not PR8, but seems more likely to be closely related to the 1947 A strains which caused large epidemics in Sweden and small epidemics in Holland, England, and America.

Discussion of Table

In *England and Wales* there were decreases in the notifications of measles 2,263, diphtheria 34, and scarlet fever 33, with an increase in the notifications of whooping-cough 519.

The largest declines in the notifications of measles were Lancashire 681, Yorkshire West Riding 668, Nottinghamshire 137, and Essex 94; in contrast to this general decline, increases were recorded in Staffordshire 73 and Yorkshire East Riding 68.

Notifications of diphtheria gave the lowest weekly total ever recorded and were 8 below the previous record low level. The chief centres of diphtheria during the week were Lancashire 20, Durham 13, London 11, Warwickshire 9, and Cheshire 8; the remaining 31 notifications were distributed over sixteen counties.

Increases in the incidence of whooping-cough were recorded in Lancashire 121, Staffordshire 64, Warwickshire 55, Leicestershire 46, and Middlesex 40.

The largest returns for dysentery were London 27 (St. Pancras 13) and Lancashire 17 (Liverpool C.B. 6 and Oldham C.B. 5).

Notifications of acute poliomyelitis increased by 15, and multiple cases were recorded in Kent 5; Middlesex 5 (Harrow U.D. 2); London 4 (Southwark 2); Lincolnshire 3; Wiltshire 2; Buckinghamshire 2; Essex 2; and Lancashire 2 (Manchester C.B. 2).

In *Scotland* there was an increase in the notifications of whooping-cough 163, measles 47, scarlet fever 43, acute primary pneumonia 41, and dysentery 11.

In *Eire* there was a decrease of 13 in the notifications of scarlet fever.

In *Northern Ireland* the chief feature of the returns was an increase of 22 in the notifications of whooping-cough. Notifications of measles increased by 32 in Tyrone county, while in the remainder of the country a decrease of 24 was reported.

Week Ending January 22

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,311, whooping-cough 1,942, diphtheria 131, measles 10,254, acute pneumonia 1,050, cerebrospinal fever 24, acute poliomyelitis 26, dysentery 104, paratyphoid 1, and typhoid 3.

Medical News

A 110th Anniversary

A dinner to celebrate the 110th anniversary of the *Medical Press* was held in London on Jan. 26. It was presided over by Sir Cecil Wakeley, the present editor, and was attended by about 60 guests, including Lord Moran, Lord Horder, Sir Edward Mellanby, Sir Wilson Jameson, and the editors of the *British Medical Journal* and the *Lancet*, and many others identified to a greater or less degree with medical journalism. A portrait dated about 1819 of Arthur Jacob, the founder and first editor of the *Dublin Medical Press*—the original title—and a number of personal relics relating to him and to the second editor, his son, Archibald Jacob, were exhibited. Lord Moran, in proposing the health of the journal, said that one of the remarkable features of the early issues of the *Medical Press* was its insistence upon freedom. Sir Cecil Wakeley, in reply, said the *Medical Press* differed from many other medical journals in various respects—for one thing, its editors had always been men in clinical practice—but like its contemporaries it had stood throughout its history for freedom of expression of opinion.

Dr. H. Guy Dain, proposing the toast of "Medical Journalism," said that one of the things of which the medical profession could be most proud was that it did not seek any "closed shop" for its information. Any new development or discovery was immediately published to the whole world, and nobody attempted to make any profit out of it for himself. The medical journals of Great Britain stood comparison with those of any other country. If they were, on the whole, cautious and conservative, that was a fault on the right side. Sir Heneage Ogilvie, editor of the *Practitioner*, responding, observed that the medical journals, serving the most highly educated, critical, and diverse public—the public of doctors—had maintained a high standard. Mr. R. F. West, a member of the firm of Baillière, Tindall and Cox, the publishers of the *Medical Press*, read from Arthur Jacob's initial editorial in the first issue in 1839: "A free press is the most powerful means in existence to elicit truth, to encourage honesty, to drive out folly, and to resist oppression."

Swiney Prize

The Swiney Prize for medical jurisprudence for 1949 has been awarded, on the recommendation of a joint committee of the Royal Society of Arts and the Royal College of Physicians of London, to Professor John Glaister, for his work "Medical Jurisprudence and Toxicology." This is the second occasion on which Professor Glaister has received the Swiney Prize, it having been awarded jointly to him and Professor J. C. Brash in 1939 for their book "Medico-Legal Aspects of the Ruxton Case." The prize, which consists of a £100 silver cup and money to the same amount, is awarded on every fifth anniversary of the testator's death. It is offered alternately for medical and general jurisprudence.

Fellowships and Scholarships in Dentistry

The Nuffield Foundation announces in the advertisement pages of this week's *Journal* that it is prepared to award a number of fellowships and scholarships in dentistry. Full particulars can be obtained from the secretary of the Foundation, 12 and 13, Mecklenburgh Square, London, W.C.1. The closing date for applications for fellowships is March 1 and for scholarships June 30.

National Institute for the Deaf

The annual report for 1948 of the National Institute for the Deaf describes some of the more important activities of the Institute over the past year. A co-ordinated scheme for approaching local authorities under the National Assistance Act has been prepared for the guidance of welfare societies for the deaf, and a new scheme for the emergency training of lip-reading teachers has been launched. The report also records that the incorporation of the Institute has been completed.

Central Council of Physical Recreation

The Central Council of Physical Recreation has started a new quarterly journal called *Physical Recreation*. It will give news of sports, games, and athletics, and information about holidays and meetings. The journal costs 1s. and is obtainable from the C.C.P.R. at 6, Bedford Square, London, W.C.1.

Wills

Dr. Samuel Walton Wheaton, a former medical officer of the Ministry of Health and assessor to the Miners' Welfare Committee, left £52,569. Dr. William Austin Robb, pathologist to the Royal Devon and Exeter Hospital, left £25,045. Dr. Percy Glyn Savours Williams, of Exmouth, left £26,686; and Dr. Christopher Richard Kempster, of Great Portland Street, W.1, £6,846.

COMING EVENTS

Symposium on Parasitic Infections

The New York Academy of Medicine will hold a symposium on the biology, metabolism, immunity, diagnosis, and treatment of the more common human parasitic infections on March 15 and 16. Information may be obtained from the Secretary of the Academy, 2 East 103 Street, New York, 29.

Pathology Congress: Date Changed

The date of the 5th International Congress of Comparative Pathology at Istanbul has been changed to April 22–29. Delegates and members who intend to take part should notify Professor N. R. Belger, Taksin, Siraserviler 75/3, Istanbul, Turkey, or the honorary secretary, British National Committee, immediately. A boat will leave Marseilles on April 15 and arrive at Istanbul on April 21. On the return journey a boat departs on April 29 and arrives at Marseilles on May 4. Members who wish to travel by air will leave London on April 19, arriving at Istanbul on April 20. They will reach London after the Congress on May 1. Full particulars of itineraries and hotel accommodation can be obtained from Messrs. Thos. Cook and Son, Ltd., Berkeley Street, London, W.1. As accommodation in Istanbul is limited, early booking is advisable.

SOCIETIES AND LECTURES

Monday

LONDON UNIVERSITY.—At Institute of Psychiatry, Maudsley Hospital, Denmark Hill, London, S.E., Feb. 7, 4.30 p.m. "*The Transmission of Nervous Activity*," by Dr. G. L. Brown.

LONDON: UNIVERSITY COLLEGE.—At Physiology Theatre, Gower Street, London, W.C., Feb. 7, 4.45 p.m. "*The Ultracentrifuge and Electrophoresis Apparatus in Protein Research*," by Dr. P. Johnson, Ph.D.

Tuesday

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 47, Queen's Gate Terrace, London, S.W., Feb. 8, 7 for 7.30 p.m. Discussion: "*Insidious Onset of Grave Disease*." To be opened by Dr. Desmond MacManus.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—Feb. 8, 5 p.m. "*Histopathology of the Skin*," by Dr. I. Muende.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., Feb. 8, 11 a.m. "*Bacterial (Non-gonococcal) and Spirochaetal Urethritis*," by Dr. A. H. Harkness.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, Keppel Street, W.C., Feb. 8, 5.15 p.m. "*Virus Research and the Virus Problem*," by Dr. Pierre Lépine (Institut Pasteur, Paris).

LONDON: UNIVERSITY COLLEGE.—At Physiology Theatre, Gower Street, London, W.C., Feb. 8, 5.15 p.m. "*The Integration of the Bodily Functions*," by Dr. E. A. Underwood.

Wednesday

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., Feb. 9, 11 a.m. "*Abacterial Urethritis-cervicitis and Inclusion Blenorrhoea*," by Dr. A. H. Harkness.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow.—Feb. 9, 5 p.m. "*Researches into Intrathoracic Tuberculosis in Childhood*." James Watson Prize Lecture by Dr. J. H. Hutchison.

ROYAL SANITARY INSTITUTE.—At 90, Buckingham Palace Road, London, S.W., Feb. 9, 2.30 p.m. Discussion: "*The Purification and Control of Swimming-bath Water*," to be opened by Mr. R. C. Hoather, Ph.D., and Dr. G. J. Laws.

Thursday

EDINBURGH ROYAL INFIRMARY.—Feb. 10, 5 p.m. "*Diet and Dental Health*." Honyman Gillespie Lecture by Dr. A. P. Meiklejohn.

HUNTERIAN SOCIETY.—At Grosvenor House, Park Lane, London, W., Feb. 10. Annual dinner.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—Feb. 10, 5 p.m. "*Physio- and Electro-therapy*," by Dr. R. T. Brain.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330–2, Gray's Inn Road, London, W.C.—Feb. 10, 11.15 a.m. "*The Physical Principles of Audiometry and Hearing-aids, I*," by Dr. T. S. Littler.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., Feb. 10, 11 a.m. "*Reiter's Syndrome*," by Dr. A. H. Harkness.

LONDON UNIVERSITY.—At Large Lecture Theatre, St. George's Hospital Medical School, Hyde Park Corner, London, S.W., Feb. 10, 4.30 p.m. Lecture-demonstration: "*Neurology*."

LONDON UNIVERSITY.—At Westminster Medical School, Horseferry Road, London, S.W., Feb. 10, 5 p.m. "*Surgical Aspects of Meningitis*." Special University Lecture by Sir Hugh Cairns.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—At College of Art and Technology, The Newarke, Leicester, Feb. 10, 7.30 p.m. "*The Catarrhal Child*," by Dr. J. Browning Alexander.

Friday

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—Feb. 11, 8 p.m. "*National Intelligence*," by Mr. J. H. Brown.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—At Miller Hospital, Greenwich High Road, London, S.E., Feb. 11, 8.30 p.m. "*The Prostatic Patient*," by Mr. J. Gabe.

LONDON CHEST HOSPITAL, Victoria Park, E.—Feb. 11, 5 p.m. "*Pathology of Pneumoconiosis*," by Dr. K. F. W. Hinson.

LONDON: UNIVERSITY COLLEGE.—At Physiology Theatre, Gower Street, London, W.C., Feb. 11, 5.15 p.m. "*Parasympathomimetic and Parasympatholytic Drugs*," by Dr. F. Bergel, Ph.D.

Saturday

PHYSICAL SOCIETY: COLOUR GROUP.—At B.M.A. House, Tavistock Square, London, W.C., Feb. 12, 2.30 p.m. 44th Science Meeting of the Group, jointly with British Psychological Society. Discussion: "*Techniques and Methods of Interpretation of Experiments in Colour as Carried Out by Physicists, Physiologists, and Psychologists*." To be introduced by Mr. R. C. Oldfield, M.A., Drs. R. W. Pickford, Ph.D., W. S. Stiles, D.Sc., L. C. Thomson, Ph.D., and W. D. Wright, D.Sc.

BIOCHEMICAL SOCIETY.—At Westminster Hospital Medical School, 17, Horseferry Road, London, S.W., Feb. 12, 11 a.m. 273rd meeting. Symposium: "*Biochemical Aspects of Genetics*."

APPOINTMENTS

EVANS, T. P., M.R.C.S., L.R.C.P., D.P.H., Divisional School Medical Officer, Amersham and Chesham Divisional Education Executive, Bucks.

HARVEY, F. C. R., M.D., D.P.H., Medical Officer of Health for District No. 1 (including Abergavenny Borough and Rural areas), Welsh Board of Health (*Not* Dr. F. C. B. Harvey as previously announced.)

NEWNHAM, C. T., M.R.C.S., L.R.C.P., D.O.M.S., Assistant Medical Officer, Paddington, British Railways, Western Region.

READ, R. A., M.B., Ch.B., D.P.H., Assistant Administrative Medical Officer, Scottish North Regional Hospital Board.

SILVERTON, M. I., M.R.C.S., L.R.C.P., D.P.H., Medical Officer of Health, Battle Rural District and Borough of Rye, Sussex. (*Corrected announcement.*)

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Christie.—On Jan. 24, 1949, at Radcliffe Infirmary, Oxford, to Hilary and Alastair Christie, a son.

Hall.—On Jan. 25, 1949, to Mardi (née Parkin), wife of Dr. Derek Hall, of Dover, a daughter.

Ogilvie.—On Jan. 7, 1949, to Joan (née Arnott), wife of Dr. A. C. Ogilvie, a daughter—Carol Anne.

MARRIAGES

Fisher—Clive.—On Jan. 22, 1949, at St. Mary's, Bryanston Square, London, W., Alfred George Timbrell Fisher, M.C., F.R.C.S., F.A.C.S., of 59, Montana Square, London, W., to Edith Frances Clive, of Birlingham Manor, near Pershore, Worcestershire.

Goodman—Sabel.—On Dec. 16, 1948, Cyril J. Goodman to Ruth Sabel, M.B., Ch.B., Tideways, Creeksea, near Burnham-on-Crouch, Essex.

DEATHS

Beachcroft.—On Jan. 24, 1949, at Beresford, South Hayling, Hants., Francis Seward Beachcroft, M.R.C.S., L.R.C.P., aged 80.

Borland.—On Jan. 12, 1949, Hugh Howie Borland, M.B., C.M., D.P.H., of Dennistoun, Glasgow, aged 91.

Burlton.—On Jan. 22, 1949, at Petersfield, Arthur Hyde Burlton, L.R.C.P.&S.Ed., Lieutenant-Colonel R.A.M.C., retired, aged 95.

Connal.—On Jan. 26, 1949, at 676, King Street, Aberdeen, Andrew Connal, O.B.E., M.D., D.P.H., D.T.M.&H., medical officer to the Aberdeen Training Centre, formerly Director of the Medical Research Institute, Lagos, Nigeria.

Dodds.—On Jan. 26, 1949, at Middlesex Hospital, London, W., Robert Leslie Dodds, F.R.C.S., F.R.C.O.G., aged 50.

Erskine.—On Jan. 21, 1949, at a Harrogate nursing home, Alexander McConnell Erskine, M.D., D.P.H., of Goole, Yorks.

Fenn.—On Jan. 23, 1949, at Conchillas, Greenway Lane, Bath, Albert Gershom Fenn, M.B., C.M.

Jones.—On Jan. 24, 1949, at sea, Crawford Maxwell Jones, M.B., Ch.B., Colonial Medical Service.

Kelly.—On Jan. 29, 1949, at 36, St. Mary's Mansions, London, W., Thomas Bernard Kelly, D.S.O., F.R.C.S.Ed., Colonel I.M.S., retired.

Martin.—On Jan. 26, 1949, Charles de Carteret Martin, M.D., of Manor Cottage, Yateley, Hants, Colonel, late I.M.S.

Mulinder.—On Dec. 9, 1948, in New Zealand, Edward Keith Mulinder, M.B., Ch.B., D.P.M.

Richards.—On Jan. 22, 1949, at Is'and of Grenada, B.W.I., Hugh Augustine Richards, M.R.C.S., L.R.C.P., D.A., of Epsom, Consulting Anaesthetist to King's College Hospital.

Rumsey.—On Jan. 24, 1949, Cecil Frank Rumsey, M.R.C.S., L.R.C.P., of Ipswich, formerly of Cambridge.

Spurrell.—On Jan. 26, 1949, at "Fro Wen," Carmarthen, Charles Spurrell, F.R.C.S., aged 82.

Thomas.—On Jan. 22, 1949, at Winterton, Norfolk, David Cyril Thomas, M.R.C.S., L.R.C.P., aged 49.

Twigg.—On Jan. 23, 1949, at Hartington, Buxton, Derbyshire, Donald Sargenson Twigg, M.R.C.S., L.R.C.P.

Willans.—On Jan. 27, 1949, at West Newton House, King's Lynn, Norfolk, Sir Frederic Jeune Willans, K.C.V.O., M.R.C.S., L.R.C.P., Surgeon Apothecary to H.M. the King's Household at Sandringham.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Diphtheria Immunization

Q.—*From what age is T.A.F. the better immunizing agent?*

A.—When the Schick test is performed on older children or on adults a skin response to the control inactivated material occurs in a proportion of cases, causing the so-called pseudo-reaction. This indicates that the individual has become sensitized to some protein fraction in the diphtheria toxoid, and the injection of a full dose of toxoid into such a person will usually be followed by a severe local and sometimes a systemic reaction. This sensitivity to diphtheria toxoid may also be elicited by a small subcutaneous injection of diluted toxoid—the so-called Moloney test. It is therefore advisable that the Schick and the Moloney tests be carried out in adults before any diphtheria prophylactic is given. Among children the proportion of pseudo-reactors is likely to be small, and a preliminary test for susceptibility is not usually carried out; but because T.A.F. is less likely to cause reaction than A.P.T. its use is recommended for school-children of 8 years and upwards who are receiving a booster dose after primary immunization in infancy. This booster dose is effective in a remarkably small dosage, and 0.2 ml. of T.A.F. should be enough to stimulate a good antibody response.

Indications for Nikethamide

Q.—*Could you tell me the indications for nikethamide? Apart from its use in shock therapy and in certain poisonings, has it any place in the treatment of acute heart failure, especially in the elderly with chronic bronchitis, of chronic myocarditis, or of coronary sclerosis?*

A.—Nikethamide, or pyridine-β-carboxylic acid diethylamide, acts mainly on the central nervous system, increasing the rate and depth of respiration and producing peripheral vasoconstriction. The analeptic action is useful in combating acute respiratory depression from anaesthetics, alcohol, hypnotics, and toxic gases. The drug is of no value in shock unless this is primarily associated with respiratory depression, nor is there any evidence in man that it consistently produces a rise in blood pressure or promotes increased coronary flow. Nikethamide has been used as a cardiac stimulant, though with doubtful effect in most cases. The relief of respiratory distress that it may produce in some cases of cardiac disease results from its effect on the respiratory system. There is no justification for the use of nikethamide in chronic myocarditis, coronary disease, or angina. It may, however, be of some value in the treatment of acute circulatory failure in pneumonia or chronic bronchitis because of its action on peripheral vascular tone. It is unlikely to be of use in acute heart failure due primarily to a cardiac defect.

Cleft Lip

Q.—*What age is most suitable for a repair operation for cleft lip? The case I have in mind is not accompanied by any other defect such as cleft palate.*

A.—The question of age is not so important as the clinical condition, but as a general rule, provided the child is 10 lb. (4,536 g.) and is steadily gaining in weight, and its haemoglobin is 80%, the operation should not be deferred. Generally speaking, this means about the fifth or sixth week.

Nematodes and Pulmonary Lesions

Q.—*Could bronchiectasis or bronchitis be associated with the presence of nematodes in a chronic case of infestation?*

A.—It is only during their relatively brief migration as larvae that certain nematodes cause pulmonary lesions in the human host. The larval forms burrowing in the intestinal wall are carried by the blood stream and are distributed in the lung capillaries, usually at the periphery, producing marked consolidation of the alveoli rather than bronchitis or bronchiectasis. The larvae then migrate to the bronchioles and from there to the trachea and larynx, but there is no evidence that they cause any great pathological changes during this part of their migration. The changes in the bronchi are thus probably insignificant in comparison with those in the lung. The trauma produced might result in symptoms which persist long after the larvae have left the lung and developed into adults in the gut. This is not usual, however, and in roundworm (*Ascaris*) infections the association of adult worms in the gut, as evidenced by the presence of eggs in the faeces, with pulmonary symptoms is usually ascribed to reinfestation.

Skin Eruption Associated with Menstruation

Q.—*Since her first confinement five years ago a woman aged 28 has suffered from an erythemato-papular eruption on both temples, starting seven days before each period, reaching its maximum during the period, and fading during the next seven days. It is absent only during pregnancy. Progesterone, "benadryl," and non-specific desensitization have failed to cure it. What are the aetiology, treatment, and prognosis?*

A.—The information given about the character of the lesions and the menstrual history is inadequate. The lesions are probably in the nature of acne frontalis or possibly an ordinary acne or rosacea. Any pelvic abnormality or infection should be excluded; it is presumed that the patient does not take any drugs over this period for pain or other symptoms. Locally, ung. hydrarg. ammon. aquosum, or a 2% sulphur and salicylic acid ointment, or fractional doses of unfiltered *x* rays, should help. Any internal treatment must rest upon a better appraisal of the background.

Winter Resorts for Respiratory Infections

Q.—*Can you help me to advise a patient suffering from chronic fibroid tuberculosis of the lungs about a health resort in Southern England where he can spend the winter months? Also, are the Canary Islands or Scilly Isles suitable?*

A.—A patient suffering from chronic fibroid tuberculosis often derives benefit from wintering at one of the health resorts along the south coast of England, particularly if it is sheltered from high winds and is not too hilly. There are a number of resorts that fulfil these conditions, and the particular one chosen usually depends on the temperament of the patient. The Canary Islands have a suitable and pleasant winter climate, but difficulties may arise in obtaining residence for a patient with active tuberculosis. The Scilly Isles usually have periods of high winds during the winter months, which can cause some discomfort to a patient suffering from chronic respiratory infection.

Subacute Combined Degeneration

Q.—*It is well known that the signs of subacute combined degeneration of the cord (S.C.D.) may be present before the blood changes of pernicious anaemia occur; also that the accompanying disorder of gastric secretion usually begins with achlorhydria and only later proceeds to deficient secretion of pepsin and intrinsic factor. (a) Is it possible to suffer from S.C.D. in the absence of achlorhydria? (b) Could the absence of intrinsic factor in such a case be demonstrated by Castle's method? (c) Is marrow puncture of help in a case of S.C.D. with a normal peripheral blood?*

A.—(*a*) Histamine-fast achlorhydria is such a constant feature of S.C.D. that on the few occasions when free HCl in the gastric juice has been reported the diagnosis may be open to question. A case of macrocytic anaemia associated with neurological signs and symptoms, together with the finding of free HCl on gastric analysis, was reported by Harvey and Murphy (*Arch. intern. Med.*, 1933, **6**, 1393), but the patient had duodenal and upper intestinal diverticula. Other cases may be of sprue or examples of the nutritional macrocytic anaemia group associated with neuritis. These cannot be regarded as S.C.D. in the usually accepted sense.

(*b*) The writer is unaware of the demonstration of intrinsic factor in any such case. As it is unknown whether the hypo-

thetical "S.C.D. factor" is distinct from the anaemia factor, the question of expecting the latter to be demonstrable would depend on whether or not one believes in a separate "neuropoietic factor."

(c) While in untreated cases of S.C.D. with slight anaemia the bone marrow may contain megaloblasts, more often at this stage the marrow picture is rather equivocal. One would not expect any pathological change in the marrow of a patient with a strictly "normal blood picture."

Stilboestrol and Testicular Swelling

Q.—*A man of 75, with multiple deposits of prostatic carcinoma in bones, has been treated with very large doses of stilboestrol. The deposits are disappearing, but the only testicle has become acutely tender and a little swollen. Is this due to the treatment?*

A.—The biological effect of stilboestrol is to produce involution of the testes and physiological castration. This is usually manifested by a shrinkage of the testicles and a disappearance of libido. It is therefore most unlikely that the swelling and tenderness of the testicle are due to stilboestrol therapy. It may be an infective epididymo-orchitis.

Persistent Symptoms after Brucella Infection

Q.—*What is the best treatment for a case of chronic Malta fever of seven years' duration? The symptoms now present are recurrent "neuritic" pains in the limbs and extreme lassitude; the only sign is an intermittent evening rise of temperature to 99°–100° F. (37.2°–37.8° C.).*

A.—Seven years is an unusual time for "Malta fever" to last, although at least one case has been reported where the infection remained active for eight years. It would thus be wise to exclude all other causes of fever before accepting the present symptoms as due to the brucella infection. Residual infections of the gall-bladder and prostate with *Brucella melitensis* may be responsible for an unduly prolonged course, and these organs should be re-examined with this in mind. Cholecystectomy may be indicated. Brucellin—a suspension of the nucleoprotein of the organism—has been used with some success (I. P. Huddleston, *Brucella Infections in Animals and Man*, New York, Commonwealth Fund, 1944). Recently there have been encouraging reports of the simultaneous administration of streptomycin and sulphadiazine.

Spasmodic Cramps

Q.—*I am 77 and have had rheumatoid arthritis in the hands and knees for four years. Following an attack of pneumonia a year ago, the rheumatic condition flared up, and since then I have been confined to bed with attacks of severe cramp in the knees and wrists lasting four or five seconds. The cramp comes on with the first movement of the limbs on awaking from sleep about 1 a.m., and recurs five or six times. The knees are painful on movement and on pressure, making walking impossible. The swelling of the knees has gone down considerably but the cramp persists. I had a course of gold injections two years ago. My erythrocyte sedimentation rate is 4 mm. in 1 hour and leucocyte count 10,000 per c.mm. What treatment would you suggest for the cramp, and what causes it?*

A.—The data in this case are insufficient for a definite opinion to be formed. The erythrocyte sedimentation rate of 4 mm. in 1 hour does not suggest a rheumatic condition but that the arthritis may be of a different nature, though the association of a type of myositis with joint symptoms is now recognized. Cramp of the kind described may be due to a calcium deficiency, and the calcium metabolism should be investigated, especially the calcium–phosphorus ratio in the blood and urine. A complete clinical examination is called for, including the nervous system. If any line of treatment which this might indicate proves unsuccessful a course of calcium with vitamin D by injection daily for a week or two, and by mouth as well for a long period, should be tried, and in addition 10 gr. (0.65 g.) of calcium aspirin given at bedtime and repeated once in the night.

NOTES AND COMMENTS

Home-cured Tobacco.—The Rev. HUGH CUTHBERTSON, president of the National Amateur Tobacco Growers' Association, writes: Your reply on the subject of amblyopia and home-cured tobacco ("Any Questions?" Jan. 22 p. 163) vindicates the position I have always taken on the importance of a fermentative process. This is recommended in the literature of the National Amateur Tobacco Growers' Association, as also the removal or crushing of the mid-rib. Plans were made last year to provide facilities for bulk fermentation under professional guidance, but had to be abandoned for the time being owing to the intervention of Customs and Excise. This does not mean that small-scale methods such as can be carried out in the home are not adequate or that there is any justification in the wording of your article for the misleading headlines in the national Press on the "danger" of home-grown. Some months ago a charge of high nicotine content in home-grown leaf was made in the Press, but my challenge to produce evidence was never met. You will realize, as we do, that some interests are prejudiced against the reputation of garden grown, indeed of any European, leaf. In point of fact, most imported tobacco sold in this country does not, I believe, go through any process of fermentation except such as naturally occurs in bond. We would like further information on this, and also whether the data you give on amblyopia on the Continent refer only to smoking or include the chewing of tobacco. A leaflet is now in the printer's hands on the subject of fermentation of amateur tobacco, a copy of which we should be pleased to send to correspondents with any other information they require. The association would give what co-operation and assistance it can in research on the subject.

Lobeline and Asphyxia.—Dr. HECTOR MACLEAN (Lockerbie, Dumfriesshire) writes: In "Any Questions?" (Dec. 11, 1948, p. 1047) on the subject of lobeline in asphyxia your expert states that the real need is for oxygen. Now if the infant can be made to breath vigorously for a few minutes, and only if, it will get all the oxygen it can be doing with. If you give lobeline by intrapulmonary injection, a few valuable seconds are saved while the lobeline gets to the respiratory centre. I once came on a hill-farmer, one of whose lambs had choked on a bottle of milk. The lamb's mucous membranes were black; it was obviously gasping its last, and there and then respirations ceased. The heart beat became feeble and the lamb was to be abandoned. I blew up its lungs with my mouth in the time-honoured fashion, and the heart beat improved, but respirations did not occur. So I gave 1 ml. of lobeline intrapulmonarily, and in "two shakes" the lamb was panting vigorously. It made an uninterrupted recovery and eventually sold for a good price. On another occasion, during "pentothal" anaesthesia, we got an alarming spasm of the glottis, and by the time the syringe was loaded up the patient was almost "finis." A few seconds after intrapulmonary injection the patient was breathing furiously, and pulse and colour were rapidly restored.

Pressure-cooker as Sterilizer.—Mr. G. H. DONALD, B.Sc., of Good Housekeeping Institute, writes: I would like to correct a wrong impression imparted in the answer given on this subject ("Any Questions?" Jan. 15, p. 121). We have tested most of the pressure cookers on the market and in all cases the air is expelled before the raising of the pressure. In fact, with pressure pans the steady stream of steam is the indication to the housewife that the gauge must be closed down for the raising of the pressure. On the other hand it is quite possible—and is often done—to start the cooking in water that is already boiling. It seems to me, too, that the dressings to be sterilized could be placed in an enamel bowl. In the latter case the steam would come into contact with them without moistening them with the water itself.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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